The importance of play in children’s lives

Photograph: Play England/Philip Wolmuth
This chapter reviews the current research on play, drawing on studies on both animals and children across a number of academic disciplines. It presents an alternative understanding of play to that of the dominant framework described in Chapter 1, which sees play as having direct instrumental value in terms of specific skills acquisition across a number of domains such as cognitive, social, emotional and physical. An attempt to summarise the benefits of play from this alternative perspective is offered here, but what the research shows is that playing is a highly complex process which operates at multiple and interconnected levels of organisation, so any attempt at summarising is vulnerable to both oversimplification and incomprehensibility. That said, the summary statement here attempts to draw together the social and emotional motivations for engaging in play, its ‘as-if’ and non-literal nature, and its role in children’s health, well-being and development.

Playing is a way of experiencing bodily and emotional sensations through engaging with the immediate real and imagined social and physical environment in any number of ways, and where the player has a sense of control. This engagement with the environment has an impact on the way in which genes are expressed (activated) and on the structural development of the brain. This change leads to further motivation for playful engagement with the environment, seeking out the bodily and emotional pleasure that playing with uncertainty in novel and flexible ways brings. This cyclical process, what Thompson and Varela (2001) refer to as dynamic coupling, enables children both to adapt to the physical and social environment and to construct their own niche within it (Pellegrini and others 2007).

From this perspective, playing is understood as a way of building and shaping the architecture of the brain in a unique manner, through its relationship to the body and to the environment rather than as a way of learning specific skills. Such a view of playing highlights the motivation (arousal and seeking out of stimuli, bodily and emotional pleasure often referred to as positive affect) and the process (engagement with both real and imagined physical and social environments), and suggests that the content of playing has little to do with the learning of any specific skills the playing may appear to represent. This has implications for the way in which adults understand the kinds of playing that have been deemed dangerous and harmful or merely frivolous and non-productive.
The structure of this chapter

As a way of setting the context for presenting recent research, the chapter opens with a brief discussion on how play has historically been understood and some contemporary challenges to that understanding. Given the challenge to our understanding of play, the core concept of development is then reframed to highlight the interconnectedness and mutual influences of genes, the brain, the body and the physical and social environment and also the lifelong nature of development.

This foundation then allows us to explore a reframing of our understanding of play, particularly through a review of the literature on play and brain development, including some contextual information on the brain. A key finding to emerge from this review is play’s role in the development of systems within the brain of reward, motivation and emotion, rather than specific cognitive skills. Following on from this is play’s role in developing resilience, a finding that has implications for policy-makers, since resilience has been identified as a key protective factor within preventative social policies for children and young people.

The research on resilience forms the central part of this chapter, and seven aspects are explored, which allow for an understanding of play to be framed within this central concept of resilience:

- emotion regulation
- pleasure and enjoyment
- stress response systems, uncertainty and risk
- playing and creativity
- playing and learning
- attachment and the development of peer play culture
- children’s play and environmental interaction.

The section on play and resilience highlights play’s role in developing adaptiveness; however, there are factors that impinge on the ability of children to play in ways that enable this development. These factors can be endogenous (from within the child) and/or exogenous (external to the child), although there will always be a relation between the two. This section explores Attention Deficit Hyperactivity Disorder (ADHD), autism and play deprivation as illustrations of factors that can impinge on playing.

Finally, the chapter considers the nature of well-being and how a reframed understanding of play might be understood to contribute to this and to particular outcomes such as health, social capital and learning.

Perspectives on play

Lytle (2005: 149) notes that ‘play is complex for it is biologically and socially given, involving order and disorder, display, entertainment, imitation, inversion and marginality’. The review of research presented here suggests that play operates at multiple levels of analysis. A full appreciation of the nature of play requires the concurrent examination of biological, psychological, and environmental/social processes and their interplay at varying developmental periods. Such an analysis is more likely to provide an integrated conceptualisation of the nature of this behaviour.

In his preface to The Ambiguity of Play, Sutton-Smith (1997) comments that following his 40 years of studying play, an appreciation of the essential ambiguity of this behaviour requires multiple perspectives. Sutton-Smith (1997: 1) commences his analysis with this statement:

We all play occasionally, and we all know what playing feels like. But when it comes to making theoretical statements about what play is, we fall into silliness. There is little agreement among us and much ambiguity.
This ambiguity may arise from the considerable diversity of play forms and behaviours, the diversity of players and the diversity of play scholarship and academic perspectives that seek to explain this ludic [playful] form.

Burghardt (2005) provides a detailed review of the modern history of studying play and notes that the ‘footprints’ established by early scholars have established the foundations for almost the entire body of modern play research. Drawing on a wide range of studies into animal and human play, Burghardt notes that for over a century many claims have been made about the role of play for the mental life and behaviour of animals (for other reviews of the study of play see Sutton-Smith 1997; Power 2000; Pellegrini and Smith 2005). Generally accepted claims of the benefits would acknowledge that ‘play allows children to use their creativity when developing their imagination, dexterity, and physical, cognitive and emotional strength’ (Ginsberg 2007: 183).

Brown (2006a) provides a useful summary of traditional approaches to describing the benefits of play:

<table>
<thead>
<tr>
<th>Generally accepted claims</th>
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<tr>
<td>Arousal seeking, fun and enjoyment</td>
<td>Children seek novelty and stimulation; play maintains arousal at optimum level.</td>
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<tr>
<td>Freedom to act independently</td>
<td>Play allows children to explore and experiment within a safe play frame.</td>
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<tr>
<td>Flexibility</td>
<td>Play supports the opportunity to try out novel combinations of behaviour; through playing children acquire a flexible approach to the world.</td>
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<tr>
<td>Social interaction and socialisation</td>
<td>Play enables children to develop social skills; through play children acquire an understanding of customs, rules and relationships.</td>
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<tr>
<td>Cognitive development</td>
<td>Play has traditionally been associated with supporting the learning process; in play children come to recognise the properties of objects and relationships between them; play is associated with higher order thinking skills.</td>
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<tr>
<td>Physical activity</td>
<td>Play contributes to the development of motor skills and co-ordination of their bodies in relation to the physical environment.</td>
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<tr>
<td>Creativity and problem solving</td>
<td>Children play with meanings, create new possibilities and combinations of behaviours and resolve tensions that may exist in play frames.</td>
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<tr>
<td>Emotional equilibrium</td>
<td>Play supports emotional growth; children ‘play out’ painful emotional experiences.</td>
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<tr>
<td>Self discovery</td>
<td>Play supports the development of self-identity.</td>
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The precise nature of the benefits of play remains a matter of conjecture, and there may be little concrete evidence to support the many claims made on its behalf. Many studies of play remain controversial, contradictory and often lack empirical support (Bateson 2005; Burghardt 2005).
However, in spite of the lack of research evidence, claims to the central importance of play have been widely discussed and debated:

Play may actually have an important role in the behavioral, social, emotional, cognitive, physiological, and developmental realms in the lives of many animals, including people. However, this role is likely to be multifaceted, variable, and often involve complex, indirect and subtle processes … It is this protean complexity that makes play an often paradoxical and socially controversial topic. (Burghardt 2005: 114)

Burghardt suggests that the historical claims for play as providing deferred benefits for the young of the species (that is, the benefits of play are not for the present but help prepare children for becoming an adult) are not matched by research evidence and indicates that perhaps the focus on studying play should centre on the immediate benefits for children. Pellegrini and others (2007) comment that play in juvenile forms is qualitatively different from adult forms of this behaviour. As such, play is more likely to have an immediate effect and the benefits are not necessarily deferred until adulthood, requiring the evaluation of this form of behaviour to be in terms of the specific age period in which they occur, and not necessarily of future benefits.

Pellegrini and Smith (2001) also suggest that the role of play in development remains controversial. Using a cost–benefit approach, they suggest that there should be benefits associated with play but they may be limited to the period of childhood rather than deferred until after this period. Suggested benefits may be physical fitness (for physical play), fighting and dominance skills (for rough and tumble play), and affiliative and theory of mind skills (social and pretend play).

Prout (2005), citing the work of Rubenstein (2002), comments that play may be connected to the enhancement of social, physical and cognitive skills. This is not necessarily to prepare a child to become a better adult; rather the benefits of playing in the present moment help to make a better child. Of course, such claims immediately raise questions about descriptions of play as purposeless and non-functional (Burghardt 2005). However, these behaviours may have benefits that extend through development and subsequent environments encountered (Pellegrini and others 2007).

Herein lies a fundamental dilemma: for the past 30 years or so, attempts at interpreting the benefits of play for children, particularly from an early childhood perspective, have been largely instrumental – explanations that see play as serving a specific purpose and outcome. Children’s play activities have been given value only to the extent that they contribute to socially valued aspects of later life or to higher level cognitive functions, what Sutton-Smith (1997) refers to as the progress rhetoric. From this perspective, play becomes a tool for guiding the development of children, giving licence for adults to determine desirable goals and censure other forms of play that appear not to contribute to this (Brown and Cheeseman 2003). The prevalence of this perspective on play has been evident throughout this literature search from the considerable volume of research studies that focus on children’s cognitive development, particularly in pretend play, and the paucity of materials that explore other forms of children’s play, notably those that adults find distasteful or worrying.

Before proceeding to consider how recent research may extend our understanding of the nature and benefits of play, it is important to explore and establish the concept of ‘development’. This following section thus briefly introduces some essential background that will help frame and situate the diverse range of recent research into children’s play.

**Reframing ‘development’**

Child development is mostly understood from the perspective of the dominant framework described in Chapter 1, a framework that is based on ‘certain principles that have for most of the last century governed research, social policy, professional practice and in many ways commonsense thinking about the nature of adult/child relations’ (Wyness 2006: 117).
Often termed ‘developmentalism’, this view is based on the idea that childhood is a universal experience during which all children progress through uniform, linear and progressive stages towards a state of completion called adulthood. Developmental psychology focuses on the individual child’s progress in adapting to a fixed environment, and socialisation theory sees the environment acting upon children as passive recipients of its influences (Wyness 2006).

For the purposes of this review, development is seen as a ‘heterogenous and complex mix of interacting entities and influences that produces the life cycle of an organism’ (Oyama 2000: 1). Rose (2006) suggests that organisms construct themselves, their brains and their behaviour out of the raw material provided by their genes and the environmental context with which they interact. Thus, development entails profound and multilayered interrelations between genes and the social, physical and cultural environment; human beings are each the product of a unique genome and a unique set of experiences. The environment in which an individual develops influences the ways in which an individual’s evolutionary acquired history is expressed (Rutter 2007; Chakravarti and Little 2006; Diamond 2007; Pellegrini and Smith 2005). On the one hand, our genetic make-up frames our mind/body responses to environmental factors, while on the other genetic expression is shaped by experience. As we grow, our brains and bodies continually change in response to this highly complex interrelationship; development is a lifelong process, not only limited to childhood.

This perspective allows for a replacement of the nature/nurture and biology/culture debates by a perspective which sees an intimate and dynamic interconnection between ‘an embodied mind, embedded in the world’ (Thompson and Varela 2001; Edelman 2006). As Prout (2005) observes, the old polarities of nature/nurture, mind/body, adult/child and so on are starting to fall away to be replaced by more holistic and inclusive approaches. Such integrated approaches attempt to explain the way that brain, body and environment exhibit self-organising and emergent processes at multiple levels. This perspective frames the exploration offered here of the relationship between play, well-being and development, based on an understanding of the playing child that:

contains ideas of evolution and adaptation, of environment and ecology, of deep laws, of nature and nurture, of genes and inheritance, of emotional repertoires, of identity and self. (Conway and others 2004: 2)

This is echoed by Bjorklund (2006) who, in his review of the emerging science of epigenetics (the biological study of the causal interactions between genes and their products), notes that development occurs as a result of continuous and bi-directional interaction between various components of developmental systems (gene-environment expression, sometimes referred to as GxE²). Environmental experiences, and the behaviours adopted to respond to these, can trigger or deactivate the expression of genetic material. This review considers that this emerging discipline holds great promise for appreciating the importance of the relationship between play and development. Bjorklund (2006: 215) summarises the central foundation for this field: ‘individuals that display a high degree of behavioral plasticity, defined as the ability to modify behaviour as a result of environmental input, are better able to adapt to novel environments than less plastic individuals’. This behavioural plasticity is especially apparent during the stage of childhood. The increased ability of ‘adaptedness’ allows individuals to enter new environments where, in response to the pressures they encounter, they can change their behaviours in more adaptive ways than their less flexible peers. As well as responding to the pressures presented by their environments, over time individuals can also change and adapt the environments in which they live (a process of niche construction). This in turn may have major evolutionary and ecological consequences for future generations as well as changing the conditions for themselves (Odling-Smee and others 2003).

As discussed later in this review, research suggests that play performs a pivotal role in developing this behavioural flexibility and niche construction.

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² It should be highlighted that genes do not directly link to behaviour. As Pellegrini and others (2007: 271) suggest, there are many steps between genetic activity and production of proteins and behaviour in a ‘complex system with possibilities of short-term and long-term feedback loops’. 
A significant feature of child development research has been its emphasis on early childhood, identified as a critical period of accelerated growth and change and as central to successful adaptation in later life. It is a time when children are perceived as vulnerable, immature and in need of constant care and protection in order to flourish (Boyden 2003). This focus on the early years has not been matched by the degree of attention given to the nature of children's experiences and development during the middle and late periods of childhood. As such, the nature of child development after early childhood is less well researched and understood.

Thompson and Nelson (2001), in their review of the dominant developmental status of the ‘first three years’ and the application of research from neuroscience to support the primacy of this period to successful development, suggest that this focus ignores the fundamental plasticity of the developing brain, certainly through the childhood and adolescent period. Also, as emerging research identifies, the brain retains an element of plasticity throughout its lifetime. Thompson and Nelson (2001) indicate that the brain regions involved in higher cognition, reasoning, planning and problem solving, have a maturational course that extends well into adolescence. Research suggests that neurogenesis (the production of new neurons) and the formation of new synaptic connections is evident in adult brain regions (Gritti and others 2002; Harms and Dunaevsky 2007).

Whilst it is recognised that childhood is a period of immaturity during which children grow and develop, the social studies of childhood introduced in Chapter 2 allow for a recognition of differences between children and their environments and also introduce the concept of children as active agents in their own lives and the importance of seeing children as human beings and not only human beings (for example, Prout 2005). This perspective sits well with the principles of interconnectedness between brain, body and environment, and also with the suggestion, explored in this chapter, that the benefits from playing are immediate rather than deferred (Burghardt 2005; Pellegrini and others 2007). In other words, playing helps children adapt to and co-construct their immediate environments as children, rather than practising skills needed in adult life.

This review of research considers the relationship between play and development across the extended period of childhood and adolescence. While not explicitly exploring beyond the period of childhood, we may also suggest that the benefits of play are not simply restricted to this period.

Reframing play

The concept of development as a continuous process, which involves a dynamic relationship between mind, emotions, body and environment, offers a broader perspective for considering the benefits of play in the context of development than one that focuses on specific skills acquisition. Childhood marks an extended period of immaturity. It is suggested that this is to enable children to best ‘fit’ the complex environments in which they find themselves. Given that children are active agents in their own development, seeking out and acquiring experiences that will shape their future behaviour (Bateson and Martin 1999), it is also suggested that play during this extended period of childhood is an ‘important strategy used to develop behaviours that are adaptive to the niches that young children and adults inhabit’ (Pellegrini and others 2007: 263).

The extended juvenile period of humans is crucial in developing plasticity and the complex set of skills necessary for survival, given that they live in highly complex and unstable environments (Burghardt 2005; Pellegrini and others 2007). The key purpose of this lengthy period is to acquire the knowledge and practice to develop and refine social skills and to establish coalitional relationships necessary for adapting to the increasingly intense and complex social landscape (Flinn 2006). This perspective is reinforced by Panksepp (2007: 7) who, in his review of research into animal laughter and play behaviour, notes ‘the play urge may be one of the few innate tools of nature that evolution provided for the epigenetic construction of fully social brains in mammalian species’.

Given the complexity of contemporary social and physical environments, it is suggested that the necessary skills required for survival in these diverse environments cannot be
The key themes identified by Burghardt’s analysis of the immediate benefits of play, in relation to humans, are explored in more detail in the following section.

**Play and brain development**

The very fact that play contains so much nonsense, so much replication, and is so flexible certainly suggests that it is the prime domain for the actualisation of whatever the brain contains. (Sutton-Smith 1997: 226)
Making the Case for Play: Gathering the Evidence (Cole-Hamilton and others 2002: 59) briefly highlighted emerging research into the connection between play and brain development suggesting that: ‘play creates a brain that has greater behavioural flexibility and improved potential for learning later in life’. The report notes that this area is attracting more interest and may in time produce more robust data concerning the effects of human play activity. This next stage of the review explores some of this research.

Attempts at understanding play and its relationship to development and well-being highlight the complexity and heterogeneity of this form of behaviour. This becomes even more problematic when we start to explore the possible relationship between play, brain and development. As Edelman (2006) acknowledges, the human brain is one of the most complicated material objects in the known universe. To give a measure of this complexity, Edelman notes that the cortical region alone contains about 30 billion nerve cells (neurons) and about one million billion connections.

Smith (2002) highlights some of the dilemmas facing attempts to relate research from the neurosciences to other disciplines, and in the context of studying children’s play we should acknowledge that neuroscience is not a unified field and that there are diverse theoretical approaches that inform research. The conditions under which laboratory testing of specific aspects of brain structure and development in animals takes place do not correspond to the complex environments inhabited by humans, and each individual brain is a unique representation of gene-environment expression (environmental experiences, and the behaviours adopted to respond to these, can trigger or deactivate the expression of genetic material). In this context, it is essential to balance findings from animal research with caution about the limits of what is understood today (Shonkof and Philips 2000). Burghardt (2005) acknowledges that there are great logistical problems in carrying out experimental research into animal play behaviours, and it is very difficult to isolate one single variable from overall behaviour patterns.

However, the emerging findings may have implications for the study of human play. Panksepp (2002: 227) notes:

> If modern molecular biology has taught us anything of profound general significance, it is that we are really not that different from other animals in the biological realm, even in most brain matters.

In addition, caution is needed in terms of interpreting information from the brain sciences. Whilst experimental research can discover, through the use of brain imaging technology, which sections of the brain become active under which conditions, quite what this may mean for humans is a matter of interpretation. For example, emotions can be seen as chemical or electrical activity in the brain, yet what these emotions actually mean, and their expression...
through bodily changes or behaviour, depends very much on the cultural environment in which people live. Emotions may be a matter of natural science; their meaning is also culturally constructed (Turner and Stets 2005).

With this in mind, some of the key features from brain science research are developed here; however, the intention is not to produce a definitive account of such a complex field of study, but to establish a basic framework for situating some of the ideas that have emerged and highlight areas that might warrant further exploration.

Before looking at recent research into the relationship between play and brain development, it is necessary to briefly introduce some of the key processes and structures associated with the ways in which the brain develops (again bearing in mind that this is still a highly contentious area and that attempting to provide a basic overview runs the risk of reducing high complexity to a simplistic and unrepresentative analysis). The intention of this introduction is to establish some context and background to the evidence that is presented later in this section.

The connectivity of the brain

The brain is remarkably flexible and malleable. Plasticity in brain function is evident not only during the period of childhood but also in adults (Harms and Dunaevsky 2007). This plasticity is evident through the ways in which brain cells (neurons) establish connections with each other via synapses. This connection is critical to ensuring the functioning of brain circuits (Edelman 2006). Synapses operate through electrical and chemical signals (neurotransmitters) which enable neurons to connect and send messages to each other. Synaptic communication takes place between neurons at all levels: locally between neighbouring neurons and globally through the production of neurochemicals that reach all regions of the brain (Lewis 2005).

Various activities and biochemical events can change the strength and connectivity between neurons. Connections that respond most adequately to a stimulus will survive, those that do not will disappear (Edelman 1992; Schore 2001). Adaptation depends on the speedy reaction and consolidation of behaviours essential to survival and the ongoing flexibility to adjust to changing events and environments (Balbenerie 2001). The developing brain is ‘under construction’ well past the first decade, and this is responsible in part for its plasticity or capacity to be shaped or moulded by experience.

While guided and framed by genetic information, a great deal of neural patterning occurs through the child’s interaction with her or his environment (often referred to as experience-dependent plasticity). Experience-dependent plasticity is idiosyncratic, designed for the survival of an individual, and optimises the individual’s adaptation to specific and possibly unique features of the environment. These processes need to be flexible, ‘such that at any time neural connections may need to be altered to reflect the unique experiences of the animal’ (Black 1998: 169). Thus, the brain is continually reorganising itself through the activities of everyday living, and the laying down of neural structure is highly individual rather than pre-established.

The structure of the brain

Lewis (2005: 257) suggests that the brain may be roughly divided into four systems, each more advanced and appearing later in evolution than the previous one:

- The brain stem forms the core of the brain and processes relatively basic response patterns. It is the seat of primary or basic emotions (including fear, anger, sadness, joy, excitement, attachment and sexual desire). This region displays little evidence of plasticity, but has wide reaching connections to other brain regions and influences these through the global transmission of neurochemicals, in particular dopamine.

- The hypothalamus acts as a central regulator of body responses to external events and again transmits neurochemicals that influence goal-directed states and helps to maintain lasting emotions or moods.

- The limbic region mediates emotional states and orientates action and attention to whatever is of current interest to the system and thus has connections ‘up’ (to the cortex) and ‘down’
(to the hypothalamus and brain stem) the brain. This area retains plasticity and is open to change on the basis of experience.

- The cerebral cortex is the key system for cognition, perception and attention and the cognitive control of emotional responses, often referred to as emotion regulation (Damasio 2003). Again, there are intimate connections between the cortex system and the limbic area.

While the brain has distinctive regions and structures, the connectivity and chemical signalling enables these regions to work together in highly co-ordinated and synchronised ways (Lewis 2005; Edelman 2006).

Lewis (2005) explains that the traditional view of top-down control and domination of emotions by the 'rational' cortex is not an accurate picture of the coordination of brain activity. Rather, we depend equally on our autonomic system (the parts of the nervous system that operate unconsciously), our ability to move, our memory and emotions, and thinking and communicating. Our brain needs all its parts to enable us to survive in our surroundings. Each animal's brain enables it to live in its own world. As Lewis (2005: 260) notes, the evolved areas of the brain work in concert or 'vertical integration':

Primitive agendas and requirements ... flow up the neuroaxis from its most primitive roots at the same time as executive attention, planning and knowledge subordinate each lower level by the activities of the cortex. If not for the bottom-up flow, the brain would have no energy and no direction for its activities. If not for the top down flow, recently evolved mechanisms for perception, action and thought would have no control over bodily states or behaviour.

Relationship to play
This brief overview of the significant processes that inform brain function and development establishes a background for a review of the work that has taken place since the publication of Making the Case for Play (Cole-Hamilton and others 2002).

The increasing interest in the relationship between the brain and play has some significant foundations. Sutton-Smith (1997) notes the enormous variability of play and suggests that this heterogeneity may indeed be the central feature of the function of play. Drawing on the work of Gould (1996), Sutton-Smith notes that successful biological evolution, rather than being dependent on precise adaptations, requires opposite characteristics:

In our world of radically and unpredictably changing environments, an evolutionary potential for creative responses requires that organisms possess ... [a] set of characteristics usually devalued in our culture: sloppiness, broad potential, quirkiness, unpredictability, and above all, massive redundancy. The key is flexibility, not admirable precision. (Gould 1996: 44; cited in Sutton-Smith 1997: 221)

Given the over-production of neurons during early childhood, Sutton-Smith (1997: 225) proposes that play's function may be 'to assist the actualization of brain potential without as yet any larger commitment to reality'. Play opens up possibilities in the brain that may be picked up later or discarded; the important feature is that the potential is kept alive, more so than if play never occurred in the first place. Evidence to support this claim is emerging in animal-based research, for example, Gordon and others (2003) note that rats who play in play arenas, and engage in rough and tumble and chase play have significantly elevated levels of brain-derived neurotrophic factor (BDNF), recognised to be a 'key modulator of neuronal development, plasticity and survival' (Gordon and others 2003: 17). Research by Van Praag and others (2005) highlights how locomotor activity in rats contributes to maintaining neural plasticity.

Spinka and others (2001: 143), in an attempt to explain how and why play behaviour evolved, suggest that a 'major ancestral function of play is to rehearse behavioural sequences in which animals lose full control over their locomotion, position, or sensory/spatial input and need to regain these facilities quickly'. By deliberately seeking out and placing themselves in
these uncertain situations, animals can begin to improvise their responses to the unexpected, drawing on conventional movements alongside atypical movements and actions to regain control and re-establish a sense of balance.

Spinka and others (2001) claim that this process does not simply relate to locomotor versatility but also extends to dealing with the emotional aspect of being surprised or disoriented. In their hypothesis of play as ‘training for the unexpected’ the importance of play lies with developing emotional flexibility by rehearsing the emotional aspect of being surprised or temporarily disoriented or unbalanced – that is by playing in a relatively safe context, emotions are modulated in play by the frame in which play occurs and the lack of serious consequences from losing control. Such uncertain experiences develop repertoires for avoiding emotional over-reaction, the ability to mediate responses and avoid harmful stress. Pellegrini and others (2007) note that the possible benefit of play, relative to other strategies, is that the behaviours generated through play can be more innovative and allow for further practice of newly developed behaviours. Play appropriates stimuli, experiences, or objects from their original meanings, creating a new frame that allows for greater freedom, interactivity and creative possibilities (Gordon and Esbjörn-Hargens 2007).

A central feature of playing is the ability to hold a paradox that something is simultaneously what it represents and not what it represents, and this enables the players to engage with ‘real’ concerns without losing full control. As Gordon and Esbjörn-Hargens (2007: 216) comment:

>The implicit or explicit limits that bind play in space and time make it safe for the player to surrender to the playful urge, take chances, try on new roles, and attempt tasks that, under normal circumstances, might be avoided as too difficult or unpleasant. It is a place where the novelty and risk of a new situation or experience only add to the intensity and pleasure of play. The player is able to be in control of being out of control and so enjoy a sense both of risk and of mastery simultaneously.

Because play provides the opportunity for new, and possibly adaptive, responses to novel environments, it may become ‘an exemplar of behaviour affecting evolutionary processes’ (Pellegrini and others 2007: 270). This idea suggests that changes made during the period of childhood may ‘launch’ the child into new developmental trajectories for the rest of their life span.

This parallels ideas from the study of gene–environment expression (GxE) on the interconnectedness of environmental experiences, behaviour and the activation or deactivation of genes. Hughes (2006: 109) also suggests that ‘play can operate both inside and outside the body’: the process of playing impacts on the organisation and structure of the brain while at the same time, the reorganisation of structure allows for further and more complex and variable play behaviours. Burghardt (2005: 177) makes a similar point by remarking that play may involve some role in refining behaviour, performance and capability and thus:

>... play gets animals doing things, and doing things may cause rapid changes in dendritic spines as well as activating chemical changes and brain areas. Animals capable of being more active and active in diverse ways are going to have more opportunities for these brain changes to take place and lead to even more behavioral change in a positive feedback manner.

Thus, play can increase the total sum of spontaneously developing behavioural structures that serve to support adaptation and survival in complex environments (Bateson 2005).

In summary at this stage, research from the (limited) evidence suggests that somatosensory (the area that responds to bodily sensations and touch), emotional and motor centres of the brain are affected by play experiences (Spinka and others 2001). Burghardt (2005) proposes that play may serve as an enhancement of brain development, not specifically to cognitive areas as much of the research into play indicates, but more accurately to the areas that link emotion, motivation and reward. It may be that play supports integration of the brain systems involved in the play process, from the brain stem and instinctive behaviours, through the limbic (emotion) regions and the paralimbic (the areas that connect the limbic and cortex systems) areas.
Making connections
Support to the above may be found in perhaps one of the most significant discoveries in terms of understanding the relationship between the brain and play – the mirror neuron system. Again, it should be acknowledged that the emerging research from the study of this neural mechanism is in its infancy and the implications for understanding play have not been fully explored.

Rizzolatti and others (2001) suggest that we understand the action of others through matching their actions through our own neuronal pathways. Following research with monkeys, Rizzolatti and others propose that there are specific neurons within key brain regions – mirror neurons – that perform this matching function. Research (Gallese and Lakoff 2004) shows that when monkeys watch others, the same neurons fire in their brains as those that fire when they actually perform the actions observed.

From this basic principle Gallese and others (2004) suggest that this mirroring mechanism may make a significant contribution to the ways in which we come to understand the actions and emotions of others. This is a complex area, but Gallese (2003: 524) summarises the key features that have emerged from research:

... motor imagery, action observation, imitation and empathy all share the same basic neural mechanisms, the mechanism of embodied simulation ... Embodied simulation enables models of real or imaginary worlds to be created. These models are the only way we have to establish a meaningful relationship with these worlds, because these worlds are never objectively given, but always recreated by means of simulated models.

Burghardt (2005) extends this into recognising that the act of imagination provides a bridge between perception and motor control. The inference is that the practice and repetition of similar (but not identical) patterns in play may establish a close integration of the physical motor areas of the brain and higher cognitive function. From this integration, individuals may then begin to develop behaviours that become separated from the actual physical actions, giving rise to pretence, fantasy and novelty of ideas. In other words, playing with others, and matching their movements and emotions also leads to developing the capacity for imagining these situations. The very act of imagining movement and action promotes activity in the brain systems associated with that motor activity. Burghardt (2005:395) continues with the recognition that this ability to imagine activity then offers the opportunity to ‘mentally rehearse different actions’, which in itself offers a valuable adaptive strategy.

Again, this connects with Spinka and others’ (2001) observations that play is essentially about learning how to respond to uncertain situations. Mental rehearsal and simulation support creativity, planning, and imagination. They suggest that play results in ‘measurable changes and enhancements in the brain systems that receive and integrate novel and complex sensory messages from the environment, control motor patterns and mediate emotional reactions to these situations’ (Spinka and others 2001: 147). The novelty and unpredictable situations generated in play cannot be resolved by existing rules and patterns but must be resolved by improvisation that draws upon existing patterns and adds new dimensions to thinking, moving and emotional flexibility.

Lytle (2005: 144) asserts that the discovery of this system may be very significant for psychology; from the studies it has been confirmed that ‘humans are special empathetic, playful creatures, neurocortically driven’. Riihela (2004) comments on the ways in which young children demonstrate an innate ability to imitate and share experiences with each other. But this is not simply a straightforward copying of actions. Mirroring or imitation requires a decision about what to imitate, a selection from a diverse range of stimuli that is likely to create a desirable response from the environment. This amazing ability to imitate is one way of opening and maintaining interaction, leading to shared activity, dialogue or play.

Further understanding of this mirror neuron system and the ways in which physical, affective and imaginative behaviours are integrated may prove to be significant to the future study of play.
Play types

Burghardt (2005) highlights the importance of attempting to classify the diversity of play in order to appreciate its role. Attempts at classification provide accounts of the qualitative distinctions among play forms. Traditional taxonomies of play have drawn distinctions between three basic categories of locomotor, object and social play.

Hughes (1996a, 2002, 2006) provides a taxonomy that is now generally accepted in the playwork field in the UK. He identifies 16 different forms that ‘range from three-dimensional movement to rough and tumble, and from exploration of, and experimentation with, objects and spaces, to dialogue and symbolism’ (Hughes 2006: 35). Taking the original ideas forward, Hughes (2006) develops a deeper exploration of the concept of play types to suggest that perhaps each play type may contribute to enhancing development in different brain regions. This idea would find support from Burghardt (2005), who acknowledges the diverse nature of play and suggests that different types of play may have their own phylogenetic (evolutionary) and ontogenetic (developmental) trajectories. Equally, Bateson (2005) suggests that play has more than one biological function: some aspects of play may support the development of the nervous system and musculature while others may primarily be concerned with survival skills both in the present and the future.

However, whilst these discrete functions may be identifiable, they exist within the overall interconnectedness of brain, body and environment. Recognising the relationship between play types and brain development leads Hughes (2006) to suggest that each play type must inevitably make its own unique contribution to supporting brain growth. Studies into the developmental timings and sequences of play would suggest that physical forms of play might be an important precursor to mental play behaviours (Burghardt 2005). As previously identified, the brain works in a highly integrated manner (Lewis 2005; Edelman 2006) and, as synaptic connections are formed and strengthened through play, it is likely that play operates across brain regions. Bateson (2005: 18) notes that human play has acquired more complex cognitive forms and functions during the process of evolution, enabling children to ‘rearrange the world in ways that ultimately enhance understanding’. Again this would find support from Spinka and others’ (2001) proposition that physical play with self, others and objects leads to developing strategies for responding to uncertain and unpredictable situations involving mental rehearsal, the use of imagination, ability to predict and solve problems, and developing creative responses. Thus, as play occurs, the results of the experiences will lead to more complex and amalgamated play forms that show greater integration of both play types and brain connectivity, a point developed by Hughes (2006) in his proposal that increasing sophistication in brain connectivity patterns would be reflected in further sophistication in the types of play displayed.

The opening stages of this review suggest that play is a unique form of adaptive behaviour: Taking Thompson and Varela’s (2001) study of the relationship of mind, body and environment as a dynamic and emergent coupling process, the evidence suggests that play operates across levels of:

- basic life regulation (homeostasis/homeodynamics and the sense of being alive)
- sensorimotor coupling with the environment (situated activity based on what the organism senses and how it moves and behaves in response to this, which in turn will impact on the neural systems that modulate and coordinate senses and movement)
- intersubjective interaction (the ability to interpret the actions of others and respond accordingly). The next stage of this review will begin to look in more detail at the nature of play and its relationship to these dynamic coupling processes.

Play and resilience

A key and fundamental finding from the evidence presented in this section is that children’s play provides a primary behaviour for developing resilience, thereby making a significant contribution to children’s well-being. There is a wide range of research from a variety of disciplines including biology, neuroscience, psychology, sociology (in particular the growing field
of the sociology of childhood), education, health, cultural studies and children’s geographies. While much of the research from these disciplines is specific to its disciplinary base, collectively they provide a rich mosaic of the relationship between play and resilience.

As an introduction we consider in more depth the possible connection between play and resilience, particularly in relation to Sutton-Smith’s (2003) assertion that, where children cannot wilfully act out beliefs in their own agency and their future through play, then depression will be the outcome.

The nature of resilience

Rutter (2006) identifies resilience as an ability that allows individuals to overcome or resist severe risks or chronic stress factors in the environment. As a concept, resilience is a very broad idea which refers to the capacity of dynamic systems to withstand or recover from significant challenges and, as such, can be studied at many levels of analysis that range from ‘the molecular to the global’ (Masten 2007: 923). Threats to the well-being of young children are commonplace. Resilience marks the ability to spring back from and successfully adapt to adversity. Masten (2001) makes the point that the most surprising result from a range of studies with children is the ‘ordinariness’ of resilience:

Resilience appears to be a common phenomenon that results in most cases from the operation of basic, human adaptational systems. If these systems are protected and in good working order, development is robust even in the face of severe adversity; if these major systems are impaired, antecedent of or consequent to adversity, then the risk of developmental problems is much greater, particularly if the environmental hazards are prolonged. (Masten 2001: 227)

The evidence presented in this literature review suggests that play operates across adaptive systems and supports the development of this ‘ordinary magic’ (Masten 2001). Research indicates that the basic foundation for resilience is a sufficient stock of ‘good things’ laid down through childhood, however partial these may be, since there is no ‘happy childhood’ that will guarantee a life free from conflict (Vellacott 2007).

Van der Hoek’s (2005) study of children growing up in poverty in an area in the Netherlands notes that not all children show problematic outcomes in the presence of stressful situations. Understanding what enables some children to do well in the face of stressful situations, while others show social-emotional or behavioural problems, may provide essential information on the mechanisms by which stressful situations, such as growing up in poverty, affect children’s lives. Finding ways to enhance resilience is a major task for child mental health professionals (Leckman and Mayes 2007).

While we do not know the degree to which negative experiences in childhood influence development, research indicates that early emotional challenges may have a significant impact; while children may be resilient in recovering from severe adversity it is not fully understood how these experiences may alter the ‘quality of their inner lives’ (Panksepp, 2001: 135). It is generally recognised that certain positive emotional experiences promote optimism, resilience and well-being, while negative emotional experiences have the opposite effect. In exploring this, Panksepp notes that more is known about the effects of negative experience than the long term ‘fertilising’ influences within the socio-emotional environment that support positive affect. While genetically encoded emotional systems provide developmental springboards, they emerge in many different ways according to the environments in which children grow. As discussed previously, the brain exhibits enormous plasticity in childhood, and early positive emotional experiences, and even mildly negative ones help to shape the brain in highly adaptive ways.

The early approaches to the study of resilience received critical attention for adopting the idea of childhood as a universal life phase that is marked by dependence and vulnerability. Using a developmental psychology approach based on the ages and stages of childhood, any response to adversity could be measured against standard norms. Those that fall outside of this are seen as children (or ‘victims’) in need of remedial care (Boyden 2003). A biomedical approach to
adversity tends to provide uniform and decontextualised measures and models used to assess all children, and fails to take into account children's agency and the multiple ways of responding to these situations (Boyden 2003).

Rutter (2006) explains that resilience is a highly complex concept that cannot be reduced to standard research techniques; it is not possible to apply questionnaire or interview methods to identify the presence or absence of specific traits:

... resilience is not a single quality. People may be resilient in relation to some sort of environmental hazard but not to others. Equally they may be resilient in relation to some kinds of outcomes but not others. In addition, because context may be crucial, people may be resilient at one time period in their life but not at others. (Rutter 2006: 4)

Consistent with the themes developed in this review to date, Cicchetti and Blender (2006) highlight the importance of adopting an interdisciplinary approach to the study of resilience which draws on interrelated perspectives that range from the cellular to the cultural. Cicchetti and Blender recognise that mechanisms of neural plasticity are integral to an appreciation of the biological aspect of resilience.

Resilience has a relationship to well-being. Contemporary approaches to well-being (considered at the end of this chapter) accept a dynamic view of resilience that acknowledges children as active beings who can interpret the world around them, make choices, define their role and identities, solve problems, reach decisions and work collaboratively with others (Masten 2006). These choices can play a substantial role in the course of development, including the course of physical and mental health or illness. Increasingly, it is recognised that any appreciation of the ways in which children develop coping strategies arises not only from psychological qualities of the child but also from factors in the child's social context such as the family, wider social networks and the quality of the local neighbourhood (Masten and Obradovic 2006). A systems perspective on resilience allows for a growing appreciation of the multilevel dynamics involved in this concept and the ways in which resilience is shaped by interactions across levels of analysis.

Van der Hoek (2005) highlights the importance of exploring resilience from a child's perspective. She notes two key considerations for adopting this approach:

- What are children's own perceptions of the stressful situation? Do they actually appraise the situation as stressful? What may appear challenging to an adult may not be as challenging to the children who are confronted by it. For example, the study highlights that for some children, the relationship with their peers was not affected by poverty, while for others this was a more serious issue leading to rejection and ridicule.

- What coping strategies do children use when confronted by a stressful situation? Van der Hoek suggests that coping may operate in a positive or negative manner, citing research which indicates that active coping, problem solving and cognitive appraisal of stressful situations are related to lower mental health problems, while avoidance and withdrawal from the situation is generally related to higher stress and mental health problems.

Through her research, van der Hoek identifies a range of coping strategies used by children to overcome the challenges associated with poverty. The results of the study indicate that children have to deal with this at every level of their daily routines and activities – home, school, peers and neighbourhood – and children vary their strategies according to where they are. The coping strategies that rely on withdrawal methods are less likely to be effective in supporting children's sense of well-being. In summary, van der Hoek notes that the act of listening to children as they relate their lived experiences provides an insight that should help to form policy interventions that take into account children's expressed needs, for example for free places to use in their social time.

Suomi's (2006) research with primates suggests that the development of resilience is a highly complex process of gene-environment interaction. Suomi comments that in their 'normal'
development pattern, rhesus monkeys move from the intimate comfort of and attachment to their mother to exploring their physical and social environment. Following this initial separation, increasing time is spent in developing social relationships, especially with same-aged peers in social play. Yet a number of monkeys show significant deviation from this 'normal' pattern through either excessively fearful or overly aggressive behaviour, with significant consequences for their developmental trajectory. Fearful monkeys spend less time playing with peers, and overly aggressive monkeys, who may be dominant in initiating play bouts, are avoided by potential playmates. Exploring this, Suomi highlights the significance of the expression a specific gene (5-HTT) in development. Variations in gene expression may 'protect' monkeys from the impact of a harmful environment, or a good environment can protect or buffer the individual from the expression of a 'bad' gene. Luthar and Brown (2007: 934), drawing on research from animal studies, suggest that different social experiences can lead to 'substantial and enduring changes in the expression of genes'. Suomi also suggests that individual differences in resilience to environmental adversity represent the product of complex interactions between genes and characteristics of the physical and social environment in which development takes place. Citing similar research into gene expression in dogs, Suomi highlights that it is highly possible that early social experiences can alter gene expression in primates which, in turn, will influence future behaviour patterns, a point made in relation to play by Bateson (2005) and Pellegrini and others (2007).

Masten and Obradovic (2006) recognise that the new wave of research into resilience has overcome many of the criticisms targeted at the earlier research efforts. Their review of the current research perspectives in studying resilience leads to a suggestion that there are recurring attributes of person, relationships and context, which serve as general predictors of resilience across diverse situations. It is evident that resilience is a multifaceted concept that draws on a wide range of internal and external factors. Increasingly, research is focused on the interrelationship between these factors and the possible ways in which they combine to produce protective effects (Atwool 2006). Given the nature of play in supporting adaptation to the unique environments that children inhabit, we would anticipate a relationship between play and resilience. The next stage of the review examines in more detail how play has a great deal to contribute to an understanding of the processes underpinning resilience.

Masten and Obradovic (2006) identify a range of common adaptive systems, including learning systems and the ability to process information and solve problems; attachment system; mastery-motivation system and self efficacy; stress response systems; self-regulation systems; family system; peer system and cultural and societal systems. This summary of adaptive systems of agreed resilience factors has been adapted to provide a framework for presenting research which indicates that play makes a significant contribution to developing resilience across a number of interrelated adaptive systems:

- emotion regulation
- pleasure and enjoyment and the promotion of positive feelings
- stress response systems and the ability to create and respond to uncertainty
- creativity and the ability to make novel connections
- learning
- attachment to people and place.

It should be stressed that the separation of research findings across these systems is largely one of convenience and ease of presenting the diverse materials. There are reciprocal relationships that run across all of these areas; it is hoped that the connections and overlap will become fully apparent.

**Emotion regulation**

Perhaps one of the most interesting themes to emerge in the study of the relationship between play and development has been the exploration of play and emotions, largely driven by the work of Sutton-Smith (2002; 2003). The key theme proposed in this section is that play is central to emotion regulation and children's ability to manage their own behaviour and emotions (Singer and others 2006).
The nature of emotions
Emotions may be viewed as part of the basic mechanism of life regulation (Damasio 2003). Because of their remarkably ancient lineage in the evolution of the brain, it is recognised that these underlying brain systems serve as a foundation for the emergence of basic social and cognitive abilities (Panksepp 2001).

Sutton-Smith (2003) acknowledges the work of Damasio (1994; 2003) in framing his hypothesis about the relationship between emotional systems and play. As an introduction to these ideas, Damasio (2003) explains that primary emotions (listed as fear, anger, shock, disgust, happiness and sadness), largely arising in the more ‘primitive’ brain regions of the hypothalamus and brain stem, are involved in the immediate tasks of survival, and provide an ‘anchor’ (Lewis 2005) to the self-organisation of the brain. They show little evidence of plasticity and change little with experience. These systems have a key role in the vertical integration of neural activity through the transmission of neurochemicals (such as dopamine) across all brain regions.

The secondary, more social emotions (such as pride, guilt, embarrassment or sympathy) emerged with the evolution of the ‘higher’ brain regions and facilitate a more delayed and considered response to external stimuli. These brain regions retain plasticity through childhood and are constantly shaped by experiences. Effective responses to external stimuli require an integration between these two systems – primary emotions can modulate and focus cognition, while at the same time cognition can moderate emotions (Gray 2004).

Lewis (2005) attributes emotions and motivations as prime processes in developing synaptic connections. Emotional activity in the limbic and paralimbic regions (generally recognised as the emotional centres of the brain), and the associated release of neurochemicals, promotes synaptic change and yields ‘novel synaptic configurations’ (Lewis 2005: 262). At the same time, emotional responses may operate to reinforce existing patterns of synaptic activity and thus minimise synaptic change.

Emotion regulation
The concept of emotion regulation has been used in such a diversity of ways within child development research as to lead some to question its validity as a scientific concept. Cole and others (2004: 318) note that emotion regulation is not a matter of expressing only positive emotions and not negative ones that are often understood as ‘culprits that disorganize functioning’. They argue that it is not the emotions themselves, or their expression, that is at issue; rather it is their effect on cognition and behaviour: The concept of emotion regulation is useful ‘as a tool to understand how emotions organize attention and activity and facilitate strategic, persistent or powerful actions to overcome obstacles, solve problems, and maintain well-being at the same time as they may impair reasoning and planning, complicate and compromise interpersonal interactions and relationships and endanger health’ (Cole and others 2004: 318).

A ‘resilience’ perspective on emotion regulation applies the concept as the role of maintaining a level of arousal that is both tolerable and flexible enough to support adaptive behaviour (Gayler and Evans 2001). It is an ‘enduring capacity for flexibility and change, in one’s goals, one’s affective states, one’s use of different cognitive, behavioural and social strategies and one’s reliance on intrapsychic versus interpersonal processes’ (Diamond and Aspinwall 2003: 150).

From a neuroscience perspective, emotion regulation, whilst difficult to separate from emotion activation, can be seen as the reciprocal and simultaneous interplay among regions of the brain leading to a vertical integration and co-ordination. The different regions combine to regulate each other to produce specific plans of action, a coherent cognitive appraisal, focused attention and a distinct feeling (Lewis and Stieben 2004). Where this regulation process is not effectively integrated it is likely to result in a range of psychopathological states that may be evidenced through poor habituation to novel stimuli, a hyperattentive bias to threat information, deficits in working memory and executive function (Thayer and Broschott 2005). Deficits in emotion regulation have been associated with common emotional and behavioural difficulties. These include poor adjustment to school, poor peer relations and social competence, and depression (Gayler and Evans 2001).
The human need for complex, flexible regulatory systems that can cope with a wide array of environmental conditions means that the development of emotion regulation begins early, takes place over an extended time period, and requires substantial external support (Berk and others 2006). Emotion regulation and modulation is about variability and flexibility, and corresponds with mental and physical health. Spinka and others (2001) acknowledge that play enables animals to develop emotional flexibility by rehearsing wide ranging emotions, but modulating these within the relatively safe context in which play occurs. This will be explored in more detail in the next section.

**Emotions and play**

The opening analysis to this section provides the background for Sutton-Smith’s (2003) proposition that play is a parody of emotional vulnerability. Lester and Maudsley (2006: 15) summarise Sutton-Smith’s basic proposal:

- primary emotions are still needed in survival emergencies
- because of this, primary emotions need to be exercised (which is what happens through play)
- at the same time, primary emotions need to be kept in check within the newer social emotions.

Sutton-Smith (2002; 2003) suggests that primary emotions can be both experienced and kept in check through children’s play. Children can experience the primary emotions within the play frame; the framing is held in place by rules, rituals and metacommunications (play faces and other signals that send the message ‘this is play’). So, although anger may be experienced in play fighting or games of contest, the players do not give way to outright aggression and violence but instead display strategy and control. Displays of courage and bravado can help to mediate the feelings of fear in deep play. Games that develop ways of bonding and developing a group identity mediate feelings of sadness and loneliness. Sutton-Smith’s analysis, according to Lester and Maudsley (2006: 15) suggests:

> ... it may be possible to connect certain types of children's play with this mediating process, for example play fighting and the balance between anger and contest; den making as a mediation of sadness and loneliness through developing shared spaces; fear mediated through deep play; disgust mediated through playful obscenities and so on.

The process of exploring this interplay of primary and secondary emotions leads Sutton-Smith to suggest that play may have adaptive value as children regulate their emotions in terms of ‘performance strategy, courage, resilience, imagination, sociability or charisma’ (Sutton-Smith 2003: 15). Through playing, individuals may find and develop their own highly personal methods for dealing with different kinds of misfortunes. The emotional nature of playing may enhance the development of connections between cortical and limbic regions, developing neural mechanisms of affect synchrony (tuning into the emotional states of others), self–other awareness and the ability to take another’s perspective. As Sturrock (2003: 4) comments, ‘the negotiation of the stairs leading between upstairs (the neocortical region) and the downstairs of the brain (subcortical) is the province of the ludic’.

Tellingly, Sutton-Smith (2003) sees play as the capacity for creating an alternative or virtual reality that offers amusement as well as excitement. The establishment of this play frame temporarily removes the limits of the everyday world and allows positive affective substitutes to emerge. In other words, children can make their worlds more exciting through play. Basically, what play prepares you for is more play, and what that gives you is more satisfaction in being alive.

**Evidence from research**

This section briefly considers some of the evidence to support Sutton-Smith’s exploration of the relationship between play and emotion regulation.

**Rough and tumble play:** Studies of rough-and–tumble play provide good examples of the nature of emotion regulation. Panksepp (2007) explores the correlation between animal and human brains with particular reference to neural emotional systems. Two powerful emotional
circuits can be found in children: separation-distress states and rough and tumble play. The separation-distress state leads to a valuing of the company of others, particularly those who will support their welfare. Panksepp proposes that an even more ‘wonderful tool’ for supporting the fuller socialisation of the brain is rough and tumble play (in a wide ranging definition of this ludic behaviour). His review notes that feelings of mirth and fun are initiated by positively valued emotion systems of the brain and suggests that the play urge ‘is one of the more genetically provided tools for facilitating the epigenetic construction of social brain’:

Although all emotional systems surely help contribute [to social brain development] a case can be made that strong and flexible prosocial strategies are critically molded through the living dynamics of play and separation distress circuits. It is through these systems in social contexts that animals come to understand what they can do to others and what they want others to do to them – it is through these comparatively ‘simple’ genetically provided emotional urges that animals may get woven naturally into their social structures. Such epigenetic effects that help refine neural circuits for social conduct might be achieved through arrays of brain-gene activational effects instigated by playful activities. (Panksepp 2007: 7)

Smith and others (2004) note that play fighting is a form of social play that may appear to be an act of aggression. Closer observation of these forms of behaviour highlight the ways in which vigorous physical behaviours (such as grappling, swinging or jumping) are mediated by the ‘play tenor’ of positive affect (laughter and the play face) and very controlled physical moves and contact. This form of play is a prime example of Sutton-Smith’s (2003) emotion-based analysis. The play frame allows for displaying a parody of the primary emotion of aggression, mediated by the secondary emotional controls that players bring to this play behaviour. Alongside this, studies of the nature of rough and tumble play indicate that there is a great deal of reciprocity in taking superior and inferior roles within the play, and that such playing is common among close friends (Smith and others 2002; Smith and others 2004).

‘...play [is a] capacity for creating an alternative or virtual reality that offers amusement as well as excitement.’
Given the importance of this play type for the development of the social brain, the evidence presented in Chapter 5, which shows that it is a form of playing that adults suppress is a cause for concern.

Pretend play: Russ (2004), approaching play from a psychoanalytical perspective, explores the nature of pretend play and affective/cognitive interactions. Russ's review of research on the importance of this form of play acknowledges that play ‘is a major arena in which children learn to express emotion, process emotion, modulate and regulate emotion, and use emotion in adaptive ways’ (Russ 2004: 5). Russ also comments that this perspective is consistent with research into the relationship between emotions and mental health.

Mohaupt and others (2006) note that pretend play is important to the process of mentalisation. Through these play forms, children use the ‘as if’ nature of pretence, fantasy, imagination and daydreaming to externalise feelings positively and naturally. By doing so, the child can explore their own emotions and form mental representations of them. Similarly, Russ (2004) comments that children can express a range of emotions in a pretend play situation, express affective themes within the play frame, gain comfort and enjoyment in their play and experience pleasure and immersion. The expression of material within the safe frame of pretend play may include both positive and negative emotions. Negative affect ‘can be expressed, worked through and mastered’ (Russ 2004: 25).

In his study of children's pretend play, Ariel (2003) observes that children draw on their emotions in the selection of play themes, and by exposing these in the play frame may modulate them or change the theme if the emotions become too unpleasant. Thus play may act as a homeostatic mechanism that regulates the level of emotional arousal within the play frame. High levels of sociodramatic play and conflict-resolution themes in play narratives are linked to good emotional self-regulation in preschoolers (Fantuzzo and others 2004). Sutton-Smith (2004) notes that the themes demonstrated through children's stories and play scenarios contain strong elements of attack, escape, accident, uncleanness and alienation. As previously discussed, these 'perils' can be connected to the primary emotions of anger, fear, shock, disgust and sadness. Following a study of children's stories, Sutton-Smith suggests that children construct and enjoy these stories because of the pervasiveness of these themes within their culture. By doing this, children create situations of pleasurable mild stress which they can overcome through their play. As such, the stories represent an early effort to achieve mental health.

Smith and Pellegrini (2005) note that pretend play is more prevalent and more encouraged by adults in modern urban societies than in foraging societies and suggest that this is an adaptation to the complexity of the society rather than a deficit in simpler societies. This cultural difference is explored in more detail in the section on children's play cultures.

Emotion regulation and environmental interaction: Studies in the field of environmental psychology highlight the significance of children's environmental transactions in supporting emotion regulation. Korpela and others (2002) review the significant findings from research into children's use of special places. They note that studies of adult memories of their favourite places indicated that they provided 'security, privacy and control'. The authors note common themes of expressed needs to be alone, the importance of hiding places and the need to escape from social demands. Their research highlights that all children from their sample could readily identify a favourite place. The majority of children and young people did consistently respond that they saw their favourite places as places to ‘pour out troubles, reflect on personal matters, to clear one's mind and feel free and relaxed' (Korpela and others 2002:388). In the conclusion to their research Korpela and others (2002: 396) speculate that:

This suggests that pouring out troubles and clearing one's mind can take place in conversation with friends in a place where children can feel free away from parents' supervision.

Pyle (2002: 319) notes the increasing lack of opportunity for children to encounter natural habitats and calls for protection of the 'unofficial countryside', the places that are the domain of unsupervised outdoor play. This aspect is further explored in Chapter 4.
**Emotion regulation and social interaction:** Research also indicates that emotion regulation and emotion understanding play a pivotal role in developing competence with peers (Lindsey and Colwell 2003; Gayler and Evans 2001). Gayler and Evans (2001) note that children's pretend play is a mode of social interaction which enhances the development of emotion regulation ability. Their study of pretend play with children aged 4–5 years concludes:

Children who demonstrated emotion regulation skills in a pretend play situation were rated as having better emotion regulation in everyday life. Regular pretend play with a more experienced play partner was related to higher frequency of adaptive affect displays, empathy and emotional self-awareness in everyday interactions. Continuing a pretend play game when faced with a negatively valenced event was related to emotion regulation in the wider context, whereas effective solutions for this event were not. (Gayler and Evans 2001: 1903)

**Therapeutic value:** Russ (2004) considers the emotional coping strategies developed in the play frame and the possible transfer to non-play contexts. Reviewing the research evidence, Russ indicates that a limited number of empirical studies suggest that children are able to draw on the 'skills' developed through play into other situations; for example, Goldstein and Russ (2001) found that the level of fantasy and imagination in children's play correlated with the number and variety of coping strategies employed in a scenario requiring impulse control over aggression.

The concepts associated with 'psycholudics' (the study of the mind at play) developed in the UK by Sturrock and Else (1998) recognise the significant emotional content that children bring into the play frame. The establishment of play frames is a metacommunication process in which children use emotional communication through cues, non-verbal signs, prosody (the patterns and rhythms of verbal communication), laughter and directly issued verbal cues. The frame is maintained through a shared simulation and reading of the cues and returns from others in the play frame. Sturrock (2003: 4) explains that a significant purpose of play is the creation of 'lexicons' of emotion that play through the body in response to the external circumstances. Again, this would suggest that play establishes a repertoire of flexible emotional responses that have adaptive value.

Russ (2004) examines evidence from child psychotherapy and other play intervention studies and indicates that play interventions, if they are focused and controlled, do reduce fears and anxieties in various areas, including children about to undergo medical procedures or problems of separation or loss. Moore and Russ (2006) note that pretend play interventions with children are effective in both inpatient and outpatient settings for preventing and reducing anxiety and distress. Pretend play also has effects on reducing pain and adaptation to chronic illness.

Russ' analysis of research into the value of play also points to the general value of imaginative play in anxiety reduction. By creating manageable situations in a pretend frame, negative emotions can be expressed and, through playing, children can increase positive affect and reduce negative affect. Russ (2004) cites the work of Strayhorn (2002) who suggests that pretend play can be used for fantasy rehearsal: the child can try out the adaptive pattern of thoughts, plans, behaviours and emotions in their imaginative play frames. This fantasy rehearsal can help a child build up habits to cope with conflict situations in 'real life':

*Using this framework, a child could reduce fears and anxiety around separation or other issues, by acting out the adaptive ways of handling the separation and feelings around it in a pretend play situation. [Russ 2004: 73]*

Thus play may provide a positive way of coping with anxiety rather than adopting avoidance strategies which give little opportunity to process difficult thoughts, emotions and experiences. Again, this perspective raises questions about an adult focus on the content of playing rather than on any benefits in terms of safe expression of emotion within the play frame as a contributor to emotion regulation.

**The importance of empathy**

Empathy is of considerable importance in developing and maintaining friendships, and in turn supporting children's well-being. As in other areas discussed in this review, the research into
this specific and vital human characteristic is wide ranging and offers diverse approaches. There appears to be general agreement that the key components of empathy involve shared neural representations, self-awareness, mental flexibility, and emotion regulation, all underpinned by specific neural systems.

Gallese and others’ (2004) research indicates that the mirror neuron mechanism (discussed in the ‘Play and brain development’ section) is involved in an ability to understand and experience the emotional states of others. This system enables an observer to resonate with the state of another individual through an internal representation of the movements and emotional expressions displayed. Preston and De Waal (2002) explain that the complex social world of humans requires that we can perceive the facial expressions, body postures, gestures and vocal intonations of others quickly and accurately to generate an appropriate response. The same nervous system link between perception and motor action that helps us to navigate the physical environment, also helps us to negotiate the social environment. The perception-action system allows for the perception of external conditions and the adjustment of our actions in response to these. Empathy also requires self–other awareness (the ability to distinguish oneself as separate from others) and mental flexibility (the ability to mediate one’s own responses triggered by the interaction).

Preston and De Waal’s (2002) review of the research evidence indicates that from very early on in development infants are capable of emotional resonance. With increasing age, knowledge and experience, individuals become better able to interpret and predict the emotional states of others and to separate them from their own internal states. The extended period of childhood and associated plasticity in brain connections gives individuals more time to integrate these systems.

Decety and Grezes (2006) suggest that this could be important because, by becoming aware of the actions, emotions, motivations and desires of others, individuals can monitor and self-regulate their own actions. Their research notes that a fascinating characteristic of human nature is the ability to use imagination consciously to simulate reality as well as fictional worlds, and explains that the deliberate use of imagination fosters creativity. Using imagination enables children to plan actions, anticipate their own and other people’s behaviour and to empathise with others. Through the use of imagination in play, real emotions can be expressed even though the characters and scenes are not ‘real’. Yet at the same time, there is generally no confusion between reality and imagination (Decety and Grezes 2006).

Brownell and others (2002: 28) note that in peer play, children not only accommodate their behaviour to one another and share emotional expression and behaviour during play, they ‘also share one another’s goals, desires and beliefs’. Children’s ability to cooperate in their play is enhanced by their emerging ability to infer the intentions of others, to recognise their feelings and thoughts and to attune their own play behaviours in response to a peer’s assumed mental state and overt behaviour. As such, the development of empathy in peer play is not simply an unconscious mirroring of the actions and emotions of others but requires higher-level...
representations and interpretations of the actions and emotions. Children must 'read well
beyond other children's emotion behaviour to understand and respond appropriately both to
their intentions or desires and to the emotions that follow from the other's success or failure
in fulfilling those desires' (Brownell and others 2002: 28). With increasing complexity in play
forms, children develop a whole series of masking and exaggeration techniques to transform
emotional responses, and this in turn requires ever more sophisticated cognitive and emotional
inferential abilities. Here again we may find a connection with Sutton-Smith's (2003) concept of
play as mediation of primary emotions by secondary emotional systems.

Russ (2004) highlights the significance of pretend play in supporting interpersonal processes,
specifically the development of empathy and ability to show concern for others, developing
self–other differentiation and trust in the play relationship, and the ability to express and
share ideas with others. Bailey (2002) notes that play is a precondition for the acquisition
of these skills. In other words, it is through play that children first come to understand self-
awareness, the distinction between appearance and reality, and possibly even the intentions of
others, which seem to underpin the development of mindreading skills.

Pleasure and enjoyment

Recent research has reflected increasing interest in the influence of positive emotions (or
affect) on cognitive processes and behaviour, although interest in this field is relatively new. As
Pressman and Cohen (2005) note from their review of research there are over 20 times more
studies on depression and disease than there are on happiness and health.

Research into positive affect investigates the impact that affect has on a wide variety
of behaviour and thought processes, including memory, decision-making, risk preference,
problem solving and creativity, to name just a few. Much of this work indicates that positive
affect facilitates flexible thinking and problem solving, mastery and optimism and enhances
Tugade and others (2005: 6) review a range of studies that demonstrate a high correlation
between resilience and positive emotions, noting that resilient individuals have 'zestful and
energetic approaches to life, and they are curious and open to new experiences ... they also use
positive emotions to achieve effective coping outcomes by using humour, creative exploration,
relaxation, and optimistic thinking as ways of coping'. Haglund and others (2007) suggest that
positive emotions play an important role in the capacity to tolerate stress, and research
indicates that they are associated with a decreased incidence of stress-related illness.

Equally, children who report reduced subjective experiences of positive affect are more likely
to display affective disorders including depression and aggressive behaviour which, in turn, may
lead to negative social interactions and peer rejection (Forbes and Dahl 2005; Dougherty 2006).

Play and enjoyment

While children experience a range of emotions and experiences in play, it is generally
acknowledged there is a prevailing mood of pleasure and enjoyment. Burghardt (2005: 138)
comments that the joy, fun, thrill or pleasure associated with play behaviour is 'surely real in
many cases and is an important perhaps critical issue in the analysis of play'. It is perhaps a
taken for granted that play is generally pleasurable, although there will not always be visible
signs of this. Turnbull and Jenvey (2004) acknowledge that there is now a consistent pattern
of evidence indicating that play encompasses the behavioural element of positive affect and
suggesting that this criterion should be seen as a key critical marker in definitions of play.
Meire's (2007) review of research into children's play considers the element of 'fun' to be a
central defining quality of children's play. In expanding on this, Meire distinguishes three main
and interconnected sources:

- The feeling of agency and control that play offers for children represents an expression of
  personal power, which operates both individually and collectively. This enjoyment of agency
  has diverse expressions. For example, it may be through physical movement and achievement,
  what Spink and others (2001) refer to as creating disequilibrium and uncertainty and
  restoring balance, or through the creation of imaginary and material worlds.
The sharing of play represents a significant element in the enjoyment of play; the co-
construction of the play frame enables children to do things together. The ‘as if’ nature
of play provides improvised and stylised narratives that establish shared excitement and
emotional security.

The enjoyment in the bodily experiences of playing: play generally has an embodied element
which finds expression in the somatosensory systems (perception and emotion).

Laughter appears to have originated in social play behaviours and may have evolved from
primate play signals. It is part of a nonverbal ‘gesture-call’ system and considerably predates
the evolution of formal language. Laughter in children occurs most frequently in the context of
play (Martin 2007). Martin’s (2007: 6) review of the nature of laughter and play notes that:

… our ability to create humor to amuse one another and evoke laughter appears
to have evolved as a means of providing us with extended opportunities for play.
Play seems to serve important social, emotional, and cognitive functions (Bateson
2005). Indeed, all mammals engage in play as juveniles, but, unlike most other animals,
humans continue to play throughout their lives, most notably through humor. When
they engage in play, people take a nonserious attitude toward the things they are
saying or doing, and they carry out these activities for their own sake – for the fun
of it – rather than having a more important goal in mind.

Sutton-Smith (2002: 19) largely concurs with the above analysis:

Play’s function is most centrally that of emotional joy and emotional peace, but its
variant actions must inevitably provide some trickle down of functional transfers – a
kind of functioning … as an adaptive potentiation.

Positive emotions can undo the impact of negative emotions, which reduce tendencies to play
and can have harmful effects on individuals over the long term (Gervais and Wilson 2005).
Positive affect fosters ‘intrinsic motivation’: enjoyment and performance of enjoyable tasks
lead to the desire for more of these experiences (Isen and Reeve 2006); what play essentially
prepares for is more play (Sutton-Smith 2003). In the long term, the cognitive-emotional
states we inhabit most in childhood sculpt the ‘neural parameters that determine who we are
as persons for the rest of our lives’ (Lewis 2005: 268).

Burghardt (2005) recognises that these qualities of play are not easily measurable. However,
the recent increasing interest in the significance of positive emotion and pleasure may help
us to appreciate the importance of children's play. Loizou’s (2005) study with 1-2 year-olds
in a childcare setting gives a vivid example of how children, even at this young age, can carry
out sophisticated and intentional acts of absurd and humorous play. As they play and explore,
children watch the consequences of their actions, including the responses of the adults and
their peers. Two central themes were observed in children's humorous play: incongruity and
empowerment. The notion of incongruity is a sophisticated kind of novelty. More specifically
an incongruous event differs from what we are used to and contravenes existing conceptual
frames. Loizou (2005: 44) sees this as a ‘higher cognitive function operating in a playful mode’.

This notion of incongruity also connects with Spinka and others’ (2001) analysis of play as
training for the unexpected. As Boyd (2004) observes, much of what children do when they play
represents highly exaggerated and exuberant movements, testing the limits of balance and
actively putting themselves in situations that may lead to loss of control, what Kalliala (2006)
refers to as ‘dizzy play’. While this may be done as a solitary form of play, a high percentage of
these forms take place in a social context, and the use of laughter may be an important social
control, as suggested in the section that considers the contribution of play to developing
empathic responses. Boyd (2004: 10) comments:

Shared expectations that allow for surprises that catch us off guard, that simulate
risk and stimulate recovery, are the key not only to play of all kinds but also to
humour. In jokes we are often primed for surprise, but despite our actively seeking
to anticipate an unexpected resolution, the punch line still takes us unawares, but
in a way that allows the tripping up of our expectations to be followed by a swift
regaining of balance.

Drawing on the work of McGhee (1989), Loizou suggests that the use of playful humour develops
social competence in children through enabling the achievement of social goals, controlling their
aggressiveness and redirecting their hostile feelings. Examples observed in the research include
events that children produced or appreciated which were related to the alteration of different
positions, sounds, gestures or words. Loizou (2005: 48) gives an example of this play:

… children enjoyed bending their knees, lifting their bottom up and looking through
their legs. This was one of the favorite activities that brought smiles or laughter to
the producer of the activity as well as to the partner of the activity.

Similarly children were observed using the range of play materials in incongruous ways that
provoked humorous responses. The second theme, empowerment, was represented by the ways
in which children used intentional playful humour to subvert adult expectations. An important
aspect of this form of play is the expectation of a reaction from their caregiver; and that
makes it even funnier for them. Loizou concludes that this form of behaviour helps them to
learn about the appropriateness of using different materials, the accepted behaviour within
the care setting and the limits within which they can act.

Tickling play
Provine’s (2004) study of the evolutionary nature of laughter refers to the game of ‘tickling
battles’ as the most benign form of human conflict. This game may ‘bind us together in a laugh-
filled give and take that may be the basis of all social play’ (Provine 2004: 217). The key feature
of this primitive form is reciprocity of action: the child being tickled may seek to escape from
being tickled, only to return and renew the interaction or begin a counter-tickling offensive.
Selden (2004) highlights the apparent paradoxical nature of this game and suggests that the
simultaneous expression of discomfort and laughter might be adaptive; discomfort motivates
the child to escape while the presence of laughter encourages the ‘tickler’ to continue and
thus helps the child being tickled to further develop skills useful in defence and combat.

For young children who cannot talk, this may be an important aspect of affect synchrony
(Schore 2001; discussed in the ‘Attachment’ section in this chapter) and entry into a mutual
social relationship in which the infant has a degree of control by, at times, expressing their
discomfort with the situation. If the situation is not perceived as safe, or if the incongruity is
too intense, the playful stimulus can evoke a distress or crying response (Gervais and Wilson
2005). Provine (2004) also suggests that tickling may be a novel approach to developing a sense
of self, based on a realisation that you cannot tickle yourself.

Laughter
An obvious expression of pleasure may be through the amount of laughter displayed by children
when they play. Thus, in the tickle-battle, laughter may be a signal that the play is pleasurable,
desired and non-aggressive (Selden 2004).

Laughter is marked by its inherent link with emotional experience generally referred to as
mirth, amusement, joy, exhilaration or positive affect (Martin 2007) and it appears to be linked
to the brain structures that underlie rough and tumble play (Panskepp 2001, 2007; Gervais and
Wilson 2005).

Rizzolatti and others (2001) comment that laughter is prone to be immediately reproduced
by others because its perception directly activates neurons that simulate the same motor
movements. A laughter message is likely to elicit positive affect, a generation of positive
feelings through a simulation of the emotional cause of the laughter. Thus, laughter is
contagious; heard laughter is a sufficient stimulus to create laughter. Martin (2007: 10)
also suggests that laughter may motivate others to behave in particular ways. For example,
laughter can be a method of positively reinforcing others for desirable behaviour (‘laughing with’), as well as a potent form of punishment directed at undesirable behaviours (‘laughing at’).

**Laughter, positive emotions and peer relationships**

Dougherty (2006), in her review of research evidence into the relationship between emotions and peer friendships notes that positive emotion facilitates the initiation and regulation of social interactions, which may promote greater peer acceptance.

Panksepp (2007), in his review of research evidence on the nature of laughter and joy, concludes that social play and humour appear to share common neural substrates. Not only does their emotional impact use the same neural mechanisms of the subcortical brain region, but also functionally they may both serve to enable animals to navigate their way through a complex and ever changing social space.

Martin (2007) cites research (Shiota and others 2004) which also proposes that positive emotions may play an important role in the regulation of interpersonal relationships. The research suggests that positive emotions play a role in accomplishing a number of interrelated tasks in building relationships: identifying potential relationship partners; developing, negotiating, and maintaining key relationships; and collective agency (working together with others to achieve goals that could not be accomplished alone). Shiota and others suggest that the humour-related positive emotion of mirth is effective for accomplishing all three of these tasks and we may infer that they form a significant role in the ways in which children initiate and maintain their play activities.

**Humour and communication**

Within play, laughter becomes an expression that has an important communication role. More recently it has been suggested that laughter is not simply about communicating that an individual is in a playful state but may also induce the positive affective state in others. Laughter serves to smooth interactions and lessen tensions within play frames.

Coates (2007) analyses the nature of humour in informal conversations and notes the way that these conversations are supported with humorous stories, banter, teasing or spontaneous creative play with words. These conversational forms are used to establish a play frame; communication and non-verbal gestures indicate that the conversation is play. Where children collaborate to develop this, we see a highly sophisticated form of play emerge. As Coates (2007: 31) suggests from her observations, shared laughter arises from this play and is a ‘manifestation of intimacy, with the voice of the group taking precedence over the voice of the individual speaker’. It may be that this co-construction of the frame demonstrates the fine attunement present among the players. This form of communication is qualitatively different from ‘serious’ talk; and Coates refers to the development of this form of play as closely resembling a jazz performance; improvising while co-constructing the themes.

Cekaite and Aronsson’s (2005) study of child initiated and collaborative humorous language play in a classroom demonstrates how playful mislabeling and speech errors, for example, leads to joking repetitions and further expressions of mispronunciations, repairs and laughter; that is, more language play. They note that although the joking was quite rudimentary it included ‘artful performance and collaborative aestheticism, involving alliteration and other forms of parallelisms, as well as code switching, laughing, and artful variations in pitch, volume and voice quality’ (Cekaite and Aronsson 2005: 169).

**Positive affect and further benefits**

Research into the nature of human laughter, while still in its infancy, offers the promise of establishing a relationship between the tendency to laugh and play and mental health (Panksepp 2001; Gervais and Wilson 2005). Pressman and Cohen (2005) report that laughter and a state of positive affect and arousal may have an impact on neurochemical activity which assists resistance to health risks.

Forbes and Dahl (2005) comment that emotions represent an inherent tendency to act, and where the prevailing theme is one of positive affect, there are likely to be associated
behaviours such as social engagement, initiating and maintaining relationships, reward seeking and motor activity.

Returning to Spinka and others (2001) and their analysis of play as uncertainty, it is suggested that the essence of humour seems to be incongruity, unexpectedness, and playfulness (Martin 2007), referred to by Gervais and Wilson (2005) as ‘nonserious social incongruity’.

Play, as an enjoyable experience, promotes positive affect, which in turn encourages further exploration, novelty and creativity. Increasingly, research highlights that the experience of positive emotion is thought to be adaptive because it allows individuals to think in a broad and flexible manner which facilitates the acquisition of long lasting personal resources that can be drawn on in times of need, a ‘broaden and build’ theory by which positive affect broadens cognitive processes (Frederickson 2006). Through play children build social, cognitive and physical resources by broadening their repertoires of actions and behaviours.

Similarly, Salovey and others (2000) suggest that positive emotions generate psychological resources by promoting resilience, endurance, and optimism. Although the positive emotions themselves may be short-lived, these resources are long lasting and may be drawn upon in moments of need, for example, when challenged by stressful events. As Siviy’s (1998) synthesis of animal research suggests, these resources may enable individuals to ‘roll with the punches’ and reduce the potential for harm when faced with stress. Another feature of positive affect may be related to the facilitation of recovery from stressful experiences, as suggested by research into the restorative effects of children’s place making and play in natural spaces (Korpela and others 2002; Kaplan and Kaplan 2005).

Being in a positive emotional state increases the ability to maintain attention, allowing individuals to focus on a wide array of information and facilitating a global visual processing bias (Strauss and Allen 2006). Strauss and Allen also highlight a range of research studies which indicate that positive affect can increase verbal fluency, problem solving and creativity, verbal recall memory, attentional scope and abstraction-flexibility.

Summary

Gervais and Wilson (2005) identify the following key features associated with the nature of spontaneous laughter as an indicator of positive affect. It:

- increases positive affect and improves mood
- mitigates negative affective responses to stressful events and acts as a defence mechanism by trivialising stressful circumstances (nervous laughter)
- enables children to maintain interactions in novel, mildly stressful situations
- acts as a ‘social lubricant’ in conversations, working to lighten mood and increase a sense of belonging within a group
- can equally ‘manipulate’ the emotions of others by reducing friction and lessening competition
- may enable new members to integrate into the group (but may also act to establish boundaries and exclude others from participation: Panksepp (2001) refers to the ‘dark side’ of laughter, the derisive laughter that arises from feelings of social scorn, where laughter becomes a tool for teasing and taunting, where group members find enjoyment in the misfortune of others)
- with its associated feelings enables young children to maintain interactions with mildly stressful stimulation so they can increase their knowledge of the world and develop social competency
- can support playful interaction.

It should be recognised that the human condition is not simply about correcting weaknesses and deficiencies, but is about strengths and resilience. Humans desire lives that are imbued with meaning and purpose, a preference for being at ease and feelings of joy (Damasio 2003) and
these states do not arise automatically by removing suffering (Duckworth and others 2005). Play is, in essence, a statement made by children that their lives are pleasurable and meaningful during the time of playing (Sutton-Smith 2002). In exploring the nature of being ‘happy’, Duckworth and others (2005) propose three interconnected domains of ‘well-being’, the first of which – the pleasant life – may exemplify Sutton-Smith’s (1997) analysis of play as ludic virtual reality. The ‘pleasant life’ (or play) involves positive emotion about the past, present, and future:

Positive emotion about the past includes contentment, satisfaction, and serenity. Positive emotion about the present includes the somatic pleasures (i.e., immediate but momentary sensory delights) and the complex pleasures (i.e., pleasures that require learning and education). Positive emotion about the future includes optimism, hope, and faith. The pleasant life is a life that maximizes positive emotions and minimizes pain and negative emotion. (Duckworth and others 2005: 635)

As Tugade and others (2004) comment, positive emotions can be an important factor that buffers individuals from maladaptive health outcomes. It may well be that play represents a vital evolved behaviour that is a critical necessity for optimal physical and emotional functioning.

**Stress response systems, uncertainty and risk**

There is an intuitively held notion that challenge and risk are important developmental processes in play (Burghardt 2005). ‘Risk’ is a daring venture, a balancing act with future possibilities as its ultimate goal. To place oneself at risk does not only mean that one places oneself in jeopardy, but also that one is situated in a zone of potential and development (Lindqvist and Nordanger 2007). Little (2006) notes that a considerable amount of children’s daily activity involves an element of risk, particularly as they play with uncertainty and extend beyond their current experiences. Yet this positive aspect of risk-taking and its benefits has very little prominence in the ‘risk’ literature. An emphasis on the positive aspects of risk-taking is perhaps particularly timely given the increasing over protection and aversion to risk that permeates many of the approaches to working with children (Little 2006).

Spinka and others’ (2001) exploration of playing with uncertainty suggests that play will inevitably contain an element of stress and risk. An example of this can be seen in Kalliala’s (2006) observations of 23 six-year-old children in Helsinki. During the period of the study Kalliala (2006: 94) observed occasions when children engaged in ‘swivelling’ and the feeling of dizziness that accompanies this action, referred to by Kalliala as ‘dizzy’ play (drawn from Caillois 1961), and notes that a ‘momentary need to turn the world upside down and fool about together seems to be a universal phenomenon’. Kalliala (2006) refers to the characteristics of dizzy play as fighting, playing noisily and chaos. The play, especially for young children, may be framed within a pretend or fantasy context. Also, it may contain ‘forbidden’ elements, both in terms of language and behaviour. Children create situations of unbalance in an attempt to regain equilibrium (Spinka et al 2001), what Sutton-Smith (1999) refers to as a ludic dialectic in which the need for excitement and novelty is balanced with safety controls within the play frame.

Playing allows for the arousal and expression of a range of emotions such as anger, fear or disgust, which may have undesirable consequences in the ‘real’ world but do not carry such consequences within the ‘as-if’ play frame (Sutton-Smith 2003). For example, research into rough and tumble play suggests that this broad range of play behaviours seems to be agonistic but in a non-serious, playful context (Fry 2005; Sheets-Johnstone 2003). Within the play frame of rough and tumble play, children describe the experience as ‘being fun’ and this is evidenced by the laughter and humour that accompanies these playful behaviours (Smith and others 2004). It appears that children’s reflective accounts of their rough and tumble play experiences clearly demonstrate an underlying friendship within the play encounters. The locomotor element of rough and tumble play provides a way of coming to grips with our vulnerabilities (Sheets-Johnstone 2003). Through physical contact, children learn about their bodies and learn to move themselves, recognising that bodies can be hurt, others can shove or hit too hard, or inadvertently cause pain and so on. But rough and tumble play ‘is all the same a sane and safe way of putting our vulnerabilities on the line’ (Sheets-Johnstone 2003: 412).
At a more serious level, Hughes (2006: 41) discusses the nature of ‘deep play’ as children’s confrontation with their significant fears, namely the human condition of mortality and death. In approaching these play situations, children believe in their ability to successfully overcome the challenges they face and display a sense of optimism.

Risk and beneficial stress
Despite an everyday understanding of stress as a negative or harmful experience, not all stress is necessarily damaging. The US National Scientific Council on the Developing Child (2005) identifies three kinds of stress in children’s lives:

- **Positive stress**: moderate and short-lived bursts of increase in heart-rate or stress hormone levels are a normal part of life and, when experienced within an overall secure context, help to develop appropriate responses to new or unusual situations.

- **Tolerable stress**: refers to traumatic events (such as an accident, or parental divorce) from which children can recover and not suffer long-term harmful effects, particularly if they are in supportive relationships.

- **Toxic stress**: this is strong, frequent and persistent events that the child cannot control and which can have harmful effects on the development brain architecture and on the ability to cope with other stressors.

This section examines the literature on positive stress and its relationship with playing.

Rutter (2006) suggests that there is evidence that in some circumstances the experience of stress or adversity can strengthen resistance to later stress. Under normal conditions of temporary stress there may be a brief enhancement of immune and cognitive function [Flinn

‘Through physical contact, children learn about their bodies and learn to move themselves, recognising that bodies can be hurt, others can shove or hit too hard, or inadvertently cause pain and so on.’
Temporary elevations of cortisol could have beneficial developmental effects involving synaptogenesis (the creation of new synapses) and neural reorganisation:

... if such changes are useful and necessary for coping with the demands of an unpredictable and dynamic social environment, elevating stress hormones in response to social challenges makes evolutionary sense if it enhances specific acute mental functions and helps guide cortical remodeling of ‘developmental exuberance’. (Flinn 2006: 151)

Burghardt (2005) also notes that for many tasks, a moderate level of arousal or anxiety may be beneficial, with increased corticosterone levels enabling enhancement of synaptic reorganisation to respond in appropriate ways to the stimulus. Haglund and others (2007: 890) comment that exposure to mild and manageable forms of stress appears to contribute to building a ‘resilient neurological profile’, and they term this ‘stress inoculation’:

Children who are faced with and overcome moderately stressful events seem better equipped to deal with significant stressors later in life … Children who learn to cope with stress also seem to gain the ability to effectively regulate their stress response systems over the long term.

However, if the stress is prolonged and severe, there are likely to be harmful outcomes.

Studies with rats (Arco and others 2007) indicate that different mild stressors increase the production of dopamine in the prefrontal cortex, and this is related to the activation of behavioural processes to cope with the stressor and the optimisation of cortical networks necessary for adaptive behaviour; the brain has design features that can readily adapt and cope with moderately stressful situations. Their research indicates that animals reared in enriched environments (with the presence of novelty and stimulation) that are used to coping with mild stressful stimuli have a reduced reaction to acute stress. In other words, they are better able to organise responses and deal effectively with these situations.

Greenberg (2004) comments that the modern medical concerns about stress focus on its potential for harm. Yet the neural coping systems that humans possess are very efficient in dealing with a moderate and short-lived amount of stress. Developing this, Greenberg highlights two significant features associated with stress response: the positive or negative affect associated with the stressor and the sense of control over the source of stress. Where there is a sense of helplessness and associated negative affect, there is likely to be a harmful impact. Haglund and others (2007) also highlight research with animals which suggests that the degree of control an organism has over the stressor will play a central role in determining whether the stressful event will lead to subsequent vulnerability or resilience. Again, returning to the outline of the nature of play in the earlier section, and drawing on Spinka and others’ (2001) analysis, we may see that the playful disequilibrium generated in play may promote stress, but this stress is deliberately and positively initiated, valued and manageable within the play frame. Greenberg comments that the tendency associated with mild stress is to energise activity, while intense stress may have the opposite effect.

Yun and others (2005) question some therapeutic treatments that are designed to reduce stress symptoms as actually contributing to the buffering of natural variation patterns and perhaps have little impact on long-term health benefits. They conclude that potential benefits to health and well-being may arise from adopting approaches that expand, rather than reduce, the dynamic range of biological experiences and environmental cues.

Panksepp (2001) also notes that modest stressors strengthen emotional and brain executive systems and may have substantial positive effects in tuning neurochemical systems. We may find that this connects with Siviy’s (1998) explanation that dopamine, norepinephrine and serotonin (key neurochemicals) have a role in orchestrating play behaviours. These are also important in co-ordinating responses to stress, and any behaviour that activates these systems in such a global manner as play must inevitably influence the future sensitivity of
these systems. Siviy (1998) cites evidence that early social experiences can alter the function of these systems, largely based on research in isolating rats in captivity. Isolated rats tend to display reduced ability to deal with social stressors. Although the evidence is far from conclusive, Siviy’s research with animals suggests that play experiences may result in a brain that is better able to deal effectively with different types of social stressors:

In other words, those of us who have had an ample opportunity to engage in play as juveniles may be better equipped at a neural level to ‘roll with the punches’ associated with daily social interactions than those who haven’t had this opportunity. (Siviy 1998: 236)

Yun and others’ (2005) research suggests that the dynamic range of environmental cues that humans have experienced may have significantly diminished over time due to increasing human interventions. Modern lifestyle changes mean that we have reduced our contact with environmental variability and stress, citing examples of extremes of temperature, hunger/satiety, experience of pain and variations in natural light.

Given that our biological system is designed to operate in complex environments, this reduction may have harmful consequences arising from the under-utilisation of compensatory biological mechanisms. Drawing on a range of research studies, Yun and others (2005) explain that the body requires a variation of input stressors for maintaining the dynamic range of the autonomic system. Heart rate variability, a measure of the dynamic range, can decline under various circumstances and lead to increased risk of heart disease. High heart rate variability is consistent with a healthy body response system. Thayer and Broschott (2005) note that low heart rate variability is a marker for a reduced ability for restoration, under-activation in the prefrontal cortex, and may be consistent with a range of conditions, including immune system dysfunction.

Yun and others (2005) also suggest that a consequence of an increasingly sedentary lifestyle may be a reduction in the dynamic range of movement. Body muscle groups exhibit great plasticity, yet this can be significantly reduced through immobilisation, even for short periods of time. Research indicates that reduction in the range of movement leads to ‘muscle atrophy, fatty deposition and inhibition of protein synthesis which may promote systemic disturbances’ (Yun and others 2005: 176).

To counteract this, Yun and others suggest that exercise-associated intermittent challenge, with irregular and unpredictable input patterns that induce wide ranging emotions along with short term and manageable stress, can increase heart rate variability, maintain fluid range of movement and increase variation of dynamic blood flow. This is also consistent with Burdette and Whitaker’s (2005) analysis of the health benefits of play. Rather than simply encouraging more physical exercise, health promotion should be seeking to enhance the resilience factor of increasing the dynamic range of physiological, psychological and social experiences.

Children as risk-takers
Morrongiello and Matheis (2004) examine the role of emotions in children’s approach to risk-taking through a study of children’s decision-making when presented with a variety of potentially risky situations. As a starting point they acknowledge the motivation for feelings of excitement, and fun is a key predictor of risk-taking behaviour among those high in sensation seeking. Their research concludes with an acknowledgement of the complexity of the interplay between emotions, cognition and the social-situational context of the risk, giving a unique and dynamic personal quality and perspective to risk-taking that will be situationally specific. The significance of these studies may also lie with the recognition that the widely researched approaches that adults have to assessing risk are also fully operational in children. Similarly, research by Levin and Hart (2003) notes that children as young as four years old can understand and follow procedures for risky decision-making tasks and are able to distinguish clearly between choices that will achieve gains and avoid losses. The research highlights comparative results for children and adults in their responses to test situations, and their results question traditional perspectives which generally hold that children are incompetent in their ability to perceive and manage risk.
Risk aversion
The current societal response to many forms of children's play behaviours, and children's relationship with their immediate environments may suggest that there is a prevailing over-controlling and fearful attitude to forms of play that contain seemingly risky elements. The emerging research suggests that this is likely to reinforce fearful behaviours in some children, increasing their anxiety and lessening their ability to cope with novelty and threat. Tonucci (2005) suggests that the current focus on continuous adult supervision of children restricts children's opportunity to explore, discover or be surprised, since adults tend to explain, anticipate and prevent any exposure to risk. To Tonucci, this presents an even more serious risk of 'never risking anything'. A comparative study with children from a working class estate and a middle class area in the UK indicates that the estate children, through a range of parenting strategies and their own agency, were able to look after themselves, and 'being streetwise meant being able to make informed decisions and take appropriate actions' (Sutton and others 2007: 32). By contrast the children from the middle class area faced more 'latent' risks, which were largely induced by parental anxiety and media reports. The chaperoning of children by parents to structured activities restricts the acquisition of competent risk assessment strategies and inculcates fears of other children in public space.

Emerging research suggests that children who develop attention bias to threat, and whose environment supports this temperament, are likely to have these behaviours significantly reinforced (Fox and others 2007). Attention bias is an over-vigilance towards stimuli that present a threat. While obviously vigilance to threat is beneficial to survival, a child with attention bias will take longer to disengage from visual attention and become more prone to stress. This enhanced sensitivity to threat is associated with underlying causes of anxiety disorders. Fox and others (2007) suggest children disposed to respond with fear and anxiety to novelty or uncertainty may have these tendencies further reinforced by influences in their immediate environments. Thus it appears that caregivers who continually highlight negative features in the child's environment in an effort to control behaviour may in fact be promoting attention bias in the child. Fox and others (2007) note that, not only does this deepen the immediate anxiety to environmental stress, but it also primes the child to respond with a similar behavioural repertoire in the future, developing avoidance strategies and maintaining anxious behaviour to threat and novelty into adulthood.

Rubin and others (2002) comment that certain parenting practices may exacerbate children's wariness and fearfulness. Thus, for example, parents' anxiety may often lead to protecting children from over-arousing situations, as evidenced through the 'discouragement of independent attempts to explore the unfamiliar, the direction and restriction of children's actions and activities (telling them what to do) and the intrusion on children's ongoing activities (stepping in to preclude the possibility of an accident)' (Rubin and others 2002: 485). They note that the result from these parenting styles may be to prevent children from engaging in necessary self-initiated coping techniques. Their longitudinal research of young children aged between two and four years old highlights that, where children who display early signs of attention bias and social reticence experience controlling caring styles, children's patterns of anxiety to novelty are increased. Similarly Kiel and Buss (2006) suggest that specific parenting styles that involve high levels of approach and inaccuracy in predicting children's distress in novel situations will have significant impact on children's future ability to respond to challenges.

Adult responses to children's risk-taking behaviour are evidenced by Smith and others' (2002) study of children's rough and tumble play forms of play fighting in school playgrounds. Their research notes that many teachers and midday supervisors tend to see play fighting in a negative way and over-estimate the number of play fights that turn into real fights.

Ball's (2004) analysis of the use of Impact Absorbing Surfaces (IAS) provides an example of the complex societal relationship between play and risk. Ball explains that the level of individual risk for a fatal accident in playgrounds falls comfortably inside the 'broadly acceptable' tier. Similarly, he reveals that the cases of injuries sustained by children during play on playgrounds amounts to two per cent of all Accident and Emergency attendances, again within tolerable
limits of broadly acceptable risk. Yet there is continual pressure to invest further in safety measures in children’s playgrounds, particularly through the introduction of Impact Absorbing Surfaces (IAS). Ball (2004: 664) notes:

One should add that attempting to address risks as low as this is problematical – there is always the possibility that interventions will create new risks of their own which, especially if the target risk is small, could result in more harm, not less. There is much anecdotal evidence, for example, which suggests that both children and parents have changed their behaviour in response to greater perceived safety in playgrounds fitted with IAS.

Ball concludes that the benefits of using IAS do not support the imposition on play providers of the significant cost implications. The article raises a more serious concern about the approach to safety in children’s play through questioning the basis for such a drive that is founded more on belief than any clear research and analysis.

**Play and creativity**

Much of the literature on play and creativity is situated within the dominant psychological framework and has largely been concerned with the ‘supposedly serious functions of problem solving, learning and exploration, as well as quantifiable kinds of creativity’ (Sutton-Smith 1997: 156). Smith (2005) gives a detailed analysis of the psychological approaches to studying social and pretend play. Yet, as Sutton-Smith (1997) suggests, play supports adaptive variability rather than logical and narrow responses. The key relationship between play and creativity exists in the flexibility of responses to the situation and the non-serious interpretation of disparate stimuli.

**Creativity and brain development**

Bateson (2005: 18) acknowledges that human play has acquired more complex cognitive forms through evolution, ‘rearranging the world in ways that ultimately enhance understanding’. He asserts that play may be an effective mechanism for facilitating innovation, a playful rearrangement of disparate thoughts into novel, nonsense combinations, ‘most of which turn out to be useless’. Siviy (1998: 236) also comments:

Widespread activation of the brain would also tend to facilitate the formation of novel connections between brain areas that might not be connected, perhaps enhancing creativity.

‘... there is a prevailing over-controlling and fearful attitude to forms of play that contain seemingly risky elements.’
Greenberg (2004) proposes that creativity is an adaptive biological trait, that is, creativity provides a demonstrable contribution to ‘fitness’:

Creativity is a potent biological adaptation in that it catalyses or facilitates a regulatory or advantageous change in response to a real or perceived stress by an individual or group of individuals.

In exploring the neural circuitry of creativity, Greenberg cites the importance of the basal ganglia and the action of the neurotransmitter dopamine. The basal ganglia are a group of nuclei that have connections along the vertical axis to the cortex, thalamus and brain stem regions, and are associated with a variety of functions that include motor control, cognition and emotions. Many organisms actively seek out novelty, and the intrinsically motivating quality of novelty can evoke a sense of pleasure in the basal ganglia and the release of dopamine; but while rewarding stimuli can activate these structures, the activation becomes more intense when the reward is unexpected. This again connects with Spinka and others’ (2001: 143) account of the ancestral function of play to provide ‘training for the unexpected’:

In short, we propose that play (1) results in increased versatility of movements used to recover from sudden ‘gravitational’, ‘kinematic’ or ‘positional’ shocks such as losing ground underfoot, falling over, being knocked over, being pinned down or being shaken vigorously; and (2) enhances the ability of the animals to cope emotionally with unexpected situations. These may include both locomotor shocks as described above, and ‘psychological’ shocks such as suddenly being faced with frightening or dangerous stimuli, unexpectedly meeting a stranger or experiencing a sudden reversal in dominance.

The brain can conjure mental pictures through neuronal activity (Burghardt 2005; Decety and Grezes 2006). This adaptive strategy enables us to rehearse different actions and to select the most appropriate without having to undertake the actual behaviours: ‘linking these mental rehearsals with possible outcomes is a hallmark of creativity, innovation, and social adeptness’ (Burghardt 2005: 397).

**Play and creativity**

Russ’ (2004) evidence review also suggests that pretend play has a vital role in the development of cognitive capabilities through problem solving and conflict resolution, approaching problems as something to be resolved and the ability to work things out. There is a body of evidence which demonstrates the effectiveness of play in promoting problem-solving abilities (Bergen 2002). Drawing on research, Bergen highlights the reciprocal relationship between pretend play and problem solving, noting that cooperative social play may have a more general influence on divergent problem solving, with thematic play having a more specific influence on semantic problem solving. Ahn and Filipenko (2007), undertaking narrative research with children from a kindergarten in Canada, highlight the way in which children explored their identity, negotiated roles and developed understandings about relationships. Much of the pretend play of young children drew on improvisational exchanges demonstrating a high level of linguistic skills (Bergen 2002).

Howard-Jones and others (2002) suggest that participation in unstructured play may lead to further creative approaches in subsequent activities; there is evidence of a ‘trickle down’ (Sutton Smith 2002) response from playing. Holmes and Geiger (2002), using a range of creative methods with preschool children, suggest that particular cognitive abilities may be enhanced through creative activities. Observations of children’s playing with blocks indicate a positive relationship between construction and language ability; those children who displayed more diverse and elaborate approaches to block use had a more varied and expansive vocabulary. The authors suggest that this may also enhance divergent thinking skills in other cognitive domains.

The results from Mullineaux and DiLalla’s (2006) longitudinal study of the connection between pretend play and creativity suggest that early pretend play behaviour is a significant predictor of later creativity in early adolescence. Overall, the research findings suggest that early
pretend play behaviours may be utilising similar cognitive mechanisms or facilitating thought processes associated with creative thinking during adolescence.

Russ (2004) comments that there is a large body of studies which have found relations between play processes and creativity. Much of the research mentioned by Russ dates back to the 1980s and 1990s, and looks at the contribution of play to cognitive processes or the global effect of play on children’s creativity. Russ’s own research, and a smaller number of studies, has also found a positive relationship between affective processes in play and creativity. A summary of research leads Russ (2004: 25) to claim that pretend play may, over time help children to become more creative by enabling them to:

- practice with free flow of associations that is a part of divergent thinking
- practice with symbol substitution, recombining of ideas and manipulation of object representations, processes associated with insight and the ability to transform ideas
- express and experience positive affect, building intrinsic motivation
- express and think about positive and negative affect themes within the comparative safety of the play frame and, through this, build up a repertoire of associations to be used in problem solving
- develop cognitive structures that enable emotion regulation.

Trevlas and others’ (2003) research with pre-school children in Greece explores the way in which children develop motor creativity through play. Trevlas and others explain that motor creativity may be seen as the combination of perceptions into new and fresh motor patterns that can be either a solution to a pre-established problem, or the expression of an idea or emotion by means of the human body. The results from their survey indicate that children who scored highly on the playfulness scale used in the research have a high predisposition for play, communication and joy and were:

… also physically creative, meaning fluency in novel and divergent movement patterns or in ideas production. He/she has, namely, a more developed ability in divergent movement, which is a product of creative and critical thinking.  
(Trevlas and others 2003: 540)

In summary, Trevlas and others acknowledge that children have a need for freedom in the selection and execution of different movements. In the same way, it is clear that children have to acquire a feeling of self-control. Through creative movement, children have the ability to express their feelings and their thoughts, and to act and communicate using their body. This expressiveness through the body manifests itself more prevalently than speech in the early years. The authors claim that play provides a framework in which children can develop and refine physical skills, try out new roles, experiment and explore and solve complex problems that cannot be solved in other ways.

**Play and learning**

*Making the Case for Play* (Cole-Hamilton and others 2002) highlights a relationship between play and learning. There is a close connection between this theme and the previous exploration of the relationship between play and ‘creativity’. This has been a traditional approach to considering the benefits of play, intuitively expressed as play supporting the development of cognitive and problem-solving skills. Russ’ (2004) review of research illustrates this by outlining the ways in which play enhances the cognitive processes of expanding vocabulary, developing logical time sequences in narratives, learning strategies for problem solving and developing divergent thinking ability.

However, as previously mentioned, Burghardt (2005) suggests that perhaps the primary benefits of play are found within the integration of motor, affective and reward systems rather than the higher cognitive aspects of brain development. This point is recognised by Russ (2004) who suggests that affective processes may account for the relationship between play, creativity and learning. Such a perspective has implications for the current adult focus on the
content of playing as an indication of what might be learned from the experience, rather than on the emotional experience the process of playing affords.

**Play in the classroom**

The idea of learning through play has a long history. Play has been identified as essential for children’s development and as a key element in effective learning (Christie 2001; Bergen 2002; Tragetton 2005; Howard and others 2006; Gmitrova and Gmitrov 2004).

Bergen (2002) synthesises research, mainly from the US and from an early childhood perspective, which explores the role of play in cognitive competence, noting that many cognitive strategies are exhibited during pretend play. Equally, Gmitrova and Gmitrov (2004) suggest that there is a growing body of evidence which supports the positive relationship between cognitive skills and high quality play. They explain that pretend play requires the ability to transform objects and actions, contains interactive social communication and negotiation, and involves role-taking and improvisation. In maintaining the play, children use many cognitive strategies such as problem-solving, joint planning and negotiation. Bergen (2002) suggests that pretend play engages many areas of the brain because it involves emotion, cognition, language and sensorimotor actions and so ‘it may promote the development of dense synaptic connections’. Bergen concludes her research review noting the growing body of evidence supporting the connection between high-quality pretend play and cognitive competence. The evidence highlighted in her report supports the necessity to ensure that children are given time and space for social pretend play experiences.

Yet, as Bergen comments, the current demands of educational testing may have reduced the time and emphasis given to supporting a play-based curriculum in the early and primary years. Given its fluidity, flexibility and unpredictability, play may be difficult to control and justify in the pursuit of the ‘serious skills’ for which teachers are held accountable. Time allocated to play, therefore, may be viewed as inefficient and better spent on more specific activities (for example focusing on literacy) where the educational benefits are scientifically clear (Zigler and others 2004).

This point is reinforced in Morgan and Kennewell’s (2006) research which suggests that primary schools in England and Wales seem to have neglected the value of play over recent years, due largely to the considerable demands of the National Curriculum and the methods encouraged by the national strategies for literacy and numeracy. The place of play in schools is also explored in Chapter 5.

**Attachment and the development of peer play culture**

Attachment may be seen as a general descriptive term for the processes that maintain and regulate continuing social relationships (Hofer 2006). Over the past decade, numerous studies have emerged which consider the significance of the child’s early attachment for healthy brain development (Schore 2001; Swain and others 2007; Hofer 2006). In humans and primates, disruption to the mother–infant bonding and attachment process has been correlated with impairment of socio-emotional and cognitive competence and with vulnerability to major psychiatric conditions (Bock and others 2005; Suomi 2006). Bock and others (2005) suggest that the synaptic circuits within the limbic area, which are pivotal in emotion regulation, learning and memory, are adapted to the animal’s early experiences. These experiences shape the network capacities for behaviour in adolescent and adult animals. Balbernie (2001) concurs with this in recognising that a child’s neural circuitry is shaped by the quality and content of their emotional surroundings. Different patterns of early infant interaction might shape the course of development for children (Hofer 2006).

The infant is a highly emotional being and can make sophisticated emotional choices, becoming attached to smells, tastes and sounds within their immediate environment (Panksepp 2001). Schore (2001) outlines a process of ‘affect synchrony’ in which, for example, the carer’s emotionally expressive face leads to periods of mutual gazing, and the caregiver and child begin to attune responses. The carer’s anticipation and response to a child’s emotional needs establishes a ‘positive informational matrix and a positive sense of intersubjectivity’ (Panksepp 2001: 148).
Viewed as a formative experience for the development of the social brain, affect synchrony (the ability to mutually read and attune emotional responses) has an impact on the development of emotion regulation, language use, and empathy across childhood and adolescence (Feldman 2007). The simultaneous matching of affect increases the degree of engagement between the partners in a rapid coordinated response that would suggest a ‘bond of unconscious communication’ (Schore 2001: 303). Thus positive attachment, according to Schore, allows for an internal sense of security and resilience. The infant can unconsciously and non-verbally regulate and attune their emotions through increasing regulation of their own bodily emotional states in a secure relationship. Indeed, Panksepp (2001) maintains that this attuning of responses and early affective resonance plays an important role in shaping the internal affective landscape: where children can have a full and open expression of their emotions they are more likely to develop effective self-regulation mechanisms.

Shared play episodes between carer and infant, in which both contribute through a repertoire of interactive behaviour, involves a sharing of affect (Decety and Jackson 2005). From an early age, play becomes an important process for the development of self-other differentiation and attributing value to verbal and non-verbal communication. It is ultimately a prerequisite for the ability to understand the feelings of oneself and others (Mohaupt and others 2006). Following extensive research studying the play and laughter patterns of rats, Panksepp (2001) suggests that early play interactions with a carer establish a foundation for later more sophisticated forms of play. An initial delight in tickling and physical contact may pave the way for peek-a-boo type play, giving rise to wider forms of positive emotions:

> The anticipation of sudden social presence and absence can magnetize the delighted attentions of infants. These antecedents may pave the way for their eventual enjoyment of unpredictability in games, as well as mischievous pranks and practical jokes. (Panksepp 2001: 155)

Ginsberg (2007) notes that parents’ observations and sharing of child-driven play experiences enable a mutual attunement and attention process that enables more effective communication with children. This also becomes a self-reinforcing process due to the positive affect generated from this attachment.

**Peer friendships**

People (including children) are embedded in a web, or ‘personal community’, of relationships within and between generations (Pahl and Spencer 2004). Relationships are important in the emotional and social development of the child during the early years of life. As Weller (2007a) comments, friendship plays an important role as a social asset and provides a valuable source of social capital for children. Children’s friendships offer an entry into wider social networks. Research into children’s social networks has also shown that they play a key role in strengthening local communities and neighbourhood safety. Parents say that they build local social networks more through their children than any other means (Weller 2007b). Equally, children themselves place high value on their friendships, as evidence to the current Good Childhood Inquiry (The Children’s Society 2007a) suggests. Here children comment that they enjoy having time to play with friends.

Development is an ongoing process, and close, emotionally involving relationships are influential throughout the lifespan. The importance of childhood may be that the brain structures which mediate social and emotional functioning begin to develop during this time in a manner that appears to be dependent upon interpersonal experience (Siegel 2001).

From an early secure attachment, the child is able to use the carer as a ‘secure base’ (Burghardt 2005) for exploration and developing further relationships with others, including the establishment of relationships with peers. The role of out-of-family relationships and activities has received less research attention than parent-child attachment, but it is likely that the child’s experience of attachment plays a role in determining the quality of his or her relationships with peers. Children with positive relationships and expectations are at an advantage in accessing and maintaining relationships outside the home (Atwool 2006). Booth-
Laforce and others (2005) suggest that there is a causal link between the nature of early attachments and children's quality of friendships in the middle years. However, they also note that strong peer friendships may also serve a compensatory function when family relations are unsupportive, providing a closeness and intimacy that may not be present in the family.

In the period of middle childhood, the role of peer friendships takes on more significance. Booth-Laforce and others (2005), summarising a number of research studies, say that having high quality friendships shows a positive correlation to peer-assessed sociability and provides a buffer to anxiety and stress. Relationships with peers help children feel safe, and this may also serve to enhance academic performance. Resources gained from close friendships may allow children to cope with a variety of community stressors (Ratner and others 2006).

Attree (2004), undertaking a systematic review of the literature on the impact of poverty into children's lives, highlights the significance of children's peer friendships and social networks outside the family as a health and psychosocial protective factor. A range of longitudinal studies highlights the significance of peer friendships for children's well-being (Dougherty 2006). Abou-ezzeddine and others' (2007) study of children's friendship and victimisation in South Korea and China notes the important protective effects offered by establishing positive relationships with at least a sub-group of peers. These protective effects may be related to a number of underlying processes. For example, positive peer relationships might encourage the development of adaptive social skills which are useful in dealing with approaches from aggressors. Also, friends may develop caring and supportive roles in looking after each other in situations of peer aggression. Their study concludes that, in line with other studies in Europe and the US, positive peer relationships moderate the association between behavioural and educational risk factors and peer victimisation. Sutton and others' (2007) research with children from two contrasting areas suggests that working class children valued their peer friendships for the protective features they offered within their estates. The children interviewed in the study talked of ‘banding together’ to provide help and support. Yet this distinctive feature of the peer culture is likely to attract attention and censure from those in authority.

Research findings suggest that having a strong mutual relationship with a peer and being popular and accepted within a peer group have independent effects on a child's feelings of self-worth (Qualter and Munn 2005). They note:

*Given … that lonely children report a lack of emotional support provided within the family … peer friendship may be a good, if not the only, source of emotional security for lonely children. Having someone with whom a child can either play or confide in may be crucial in determining how a lonely child copes with a particular stressor or with his or her loneliness in general.* (Qualter and Munn 2005: 381)
From this, it may be seen that the presence of strong, emotionally supportive friendships may serve as a protective factor. Thus, while it is most desirable for the developing child to have secure relationships with one or more primary carers, it is important to realise that attachment relationships of lesser significance may still play an important protective role for a child (Gilligan 2000, as discussed in Chapter 2).

**Attachment pathologies**

Research suggests that various forms of attachment pathologies (understood as the breakdown or absence of secure attachments) will have harmful effects, manifested through empathy disorders and a limited ability to read the emotions of others (Schore 2001; Fonagy and others 2007). Accompanying this will be deficits in self-regulation of emotions with limited ability to modulate the intensity and duration of emotional states. Panksepp (2001: 152) asserts that it is reasonable to suppose that milder effects on brain systems could establish ‘chronic shyness and introverted tendencies in children and perhaps lifelong tendencies towards submissive behaviours and feelings of defeat in adulthood’.

Recent research studies have increasingly focused on the role of emotion in children’s friendship patterns. Dougherty’s (2006) review of this research highlights the disruptive impact of negative emotions on friendships. This covers all types of negative emotions, for example, fear may predict low social status due to high behavioural inhibition and withdrawal from peer interactions, whereas anger may predict low social status due to an aggressive approach in seeking contact with others which may be perceived as threatening by peers.

A longitudinal study in the US (Rubin and others 2002) found that fifth-graders (children aged 10-11 years) without friends, compared to those with friends, had lower self-esteem and more psychopathological problems in adulthood. Rubin and others’ (2002) research notes that fifth-grade children without friends were perceived by their peers as more aggressive, less popular and more victimised and rejected than children who possessed mutual best friendships.

Qualter and Munn’s (2005) research into children’s loneliness and play partners highlights two distinct forms of loneliness:

- **Social loneliness** refers to the physical absence of other people or social isolation and may relate to a lack of group acceptance.

- **Emotional loneliness** stems from the absence of a close attachment with ‘best friends’.

Their observations of children at playtime showed that lonely or lonely/rejected children tended to choose each other as play partners and that their interactions were rated as positive by the observers. Qualter and Munn suggest that these may be ‘opportunistc’ meetings, where isolated children wander around looking for someone to play with and end up playing with other lonely children. The underlying theme of positive behaviour with each other in the play may be explained by the fact that the encounters are merely opportunistic and there is little emotional investment. The authors cite studies which suggest that arguments are the preserve of close friendships and children engage in more conflict within their friendships than outside these groups. This finds support from Goodwin’s (2006: 33) analysis of the central role of dispute and conflict in the development of peer relationships:

> Dispute is an interactional accomplishment, and one of the most important loci for the development of friendships and peer relationships. Neither an aberration or something to be avoided at all costs, it is, rather, constitutive of children’s dealings with one another, establishes group cohesiveness, and provides a primary way that activities are constituted.

Corsaro’s (2003) ethnographic study of children’s peer friendship also concurs with this analysis, noting that conflict is a natural element of children’s culture and peer relations. Corsaro’s (2003: 193) research, notes that children’s conflicts and disputes are generally seen as negative and threatening by adults, who would prefer that children ‘get along and play nicely’. Corsaro suggests that this response may have a sociocultural bias, noting that African-
American teachers and parents viewed children's peer conflicts as dramatic exchanges and responded to these with playful banter.

**Play and friendships**

Panksepp (2007: 6) notes that play is the mechanism through which young children 'learn about social dynamics in an affectively positive environment, and many behavioural and mental functions may be refined during play.' Moreover, through play experiences, the child learns about normative roles, rules, and how to negotiate his or her way through interpersonal dilemmas (Booth-Laforce and others 2005).

Activities with friends are an important part of the daily lives of children and adolescents. These activities provide children and young people with enjoyment, a sense of accomplishment and belonging, opportunities for informal learning, and a context in which to explore their social worlds. While engaged in activities, friends can get to know one anothers' likes and dislikes; disclose private thoughts; reveal their academic, social, and athletic competencies; and build shared social relationships (Mathur and Berndt 2006).

Mathur and Berndt’s comparative study of child and adolescent friendships notes that children may develop stable friendships in play, and this is where they develop the social skills needed to maintain friendships. Time spent 'hanging out,' socialising, sharing current media interests and informal activity contributes to friendship maintenance through building trust and intimacy. Mathur and Berndt highlight the importance of both the quality and quantity of opportunities for peer interaction: children and adolescents who have more opportunity for social contact and a diverse range of socialising activities perceived their friendships as being higher in quality.

Fantuzzo and others (2004) suggest that a key component of children's early peer competence is the establishment of positive interactions in play. They cite wide-ranging research which highlights that children, within their play friendships, develop the multiple skills necessary for effective peer relationships:

... entering a peer play group and assessing other children's responses to play initiations, requires the acquisition of cognitive, linguistic, and socioemotional abilities. As children develop problem solving, reasoning, and perspective taking skills through peer play interactions, they are better able to cooperate, resolve conflicts, and develop empathy. (Fantuzzo and others 2004: 183)

Their own empirical research with children aged between three and seven years old in the US Headstart programme indicates that children exhibiting high levels of peer play interaction were found to demonstrate more competent emotion regulation, initiation, self-determination, and receptive vocabulary skills. Using a range of play assessment tools to explore play interaction, play disruption and play disconnection, the study concludes that positive play engagement was associated with lower levels of aggression, shyness and withdrawal behaviours. Also, successful interaction in peer play led to greater cognitive, social, and movement/coordination outcomes while disruptive and disconnected peer play behaviours were associated with negative emotional and behavioural outcomes (Fantuzzo and others 2004).

Colwell and Lindsey (2005) summarise research which indicates that both the amount and the type of children's play are linked with qualities of peer competence. Given the heterogeneous and complex nature of children’s play and the multifaceted nature of children’s friendship patterns it is not easy to establish direct cause-and-effect connections. As such, they assert that questions remain about the specific relationship between play and social competence.

Research into pretend play in early childhood (Andresen 2005) highlights the importance of playful interaction between preschool children in making a significant contribution to their ability to self-regulate, to explore and to follow rules. In addition, in the preschool years, role-play between children is accompanied by important changes in interaction and language use through their mutual engagement in the play process.

Goodwin's (2006) detailed ethnographic research into children's playground games of hopscotch and jump rope in a US elementary school provides many examples of the ways in
which children contested and disputed play behaviours and actions of others. While the study primarily considered the social relationships developed in girls’ groups, Goodwin suggests that the interactive practices are not unique to girls. The observations clearly illustrate a range of common strategies employed by children in developing and maintaining their play frames. Such disputes provide a way of playing with language, asserting one’s position both verbally and physically, taking affective stances, challenging rule-breaking and rearranging the social structure of the group.

Freeman and Brown (2004) describe the complex nature of children’s rough and tumble play as a staging area for expressions of friendship and caring. The structure of rough and tumble play requires sophisticated interactions between experiences of being a caregiver as well as being cared for. Reed (2005) also outlines the considerable caring that takes place in rough and tumble play, with particular reference to a game called ‘Smear’, a high physical contact game observed in a youth centre by a group of boys aged between six and nine years. The observations and child interviews show clearly that there was a higher intensity of physical contact and the game was played for a longer period where the players were close friends. While other children were included, their participation lacked the intimate contact that friends displayed when playing. When, on rare occasions, children were injured in the game, there were a series of caring strategies employed by the other players to look after the injured child. As Reed (2005: 67) notes:

R and T play is a staging area for friendships, for negotiations, problem solving, to fulfil their need and belong to a group, to have intimate caring relationships with friends, experience friendly competition, develop a sense of community somewhere between the warmth and closeness of family and isolation, and indifference of the adult masculine world.

Pellis and Pellis (2007) provide a valuable summary of their own, and other, research in studying rough and tumble play in animals and the possible parallels with human forms of this play type. They note that rough and tumble play is a recurring feature of childhood, and research indicates that it has a significant role in developing social competence. Drawing on the work of Burghardt (2005), Pellis and Pellis (2007) note the fundamental characteristics of this play form as being voluntary and associated with positive affect, which clearly distinguishes it from serious fighting. In looking at the developmental sequence of this play behaviour in rats, they note the sophisticated ways in which offensive and defensive roles are organised to decrease the control that the animals have over their own and their play partner’s movements:

This organisation results in more frequent role reversals and provides the juvenile rats with an increased opportunity to experience not only novel bodily movements but also continually changing bodily configurations with their partners. (Pellis and Pellis 2007: 97)

They highlight that, as in many complex behaviours, rough and tumble play involves many areas of the brain. The pattern of behaviour and movement originates in the limbic and paralimbic regions and is mediated by the cortex, which draws upon past experiences and an assessment of the current context to develop playful actions consistent with the event. This integration is accompanied by the release of brain chemicals that promote growth and development in these areas. Pellis and Pellis point out that one of the key areas involved is the orbitofrontal cortex (OFC), a part of the brain involved in social discrimination and decision-making. Their research indicates that rats that have experienced damage to the OFC fail to modify their behaviours appropriately with their social partners in both play and non-play contexts:

Findings from several laboratories indicate that the juvenile typical pattern of play fighting produces experiences that provide feedback for some of the brain areas responsible for generating such play and so promotes development of those areas. That such feedback may actually lead to functional enhancement in the output of these brain areas as the rats mature is suggested by deficits seen in rats with OFC damage and those with intact brains that have been deprived of play-fighting
experiences as juveniles. Furthermore, these brain areas are many of the same
areas that regulate social behaviour and cognition in general, and so improvements
derived from play fighting may improve the capacity for more subtle social
interactions. (Pellis and Pellis 2007: 97)

This complements evidence of the interrelationship between brain organisation and play
discussed at the opening stages of this chapter. They conclude with a suggestion that, given
the similarity in brain structure between rats, primates and humans, experience of play fighting
in childhood is causally related to social competence.

What the evidence overwhelmingly suggests is that the relationships that children develop
from birth are of significant importance throughout the period of childhood and into adulthood.
The quality of early childhood relationships is likely to affect the development of the child's
sense of self in relationship with others, developing a capacity for emotional coupling, self-
other awareness and the ability to understand the perspectives of others.

The neural mechanisms that underpin this capability (limbic-cortical vertical integration)
retains high plasticity throughout childhood, and while the initial attachment to a primary
caregiver is vital, it is not the sole determinant of developing effective empathic responses and
emotional self-regulation. In other words, as Bruer (1999: 188) comments, we should never lose
sight of the fact that humans are highly adaptive and ‘our children are remarkably resilient’.

Children's play culture

The literature on the nature of peer friendships and play reveals contrasting research
approaches. There are instrumental studies which see play as a medium in which children learn
and acquire the appropriate social and cognitive skills required to become a competent adult.
In this context, culture is produced for children by adults (Mouritsen 1998). This is represented
through the institutional world, which is perceived as ‘quality culture’. This adult-derived culture
is designed to socialise children in the qualities that are deemed to be socially desirable and
prepares the child to become a competent adult. The nature of these instrumental studies
draws on empirical testing methods, generally employing tools that include teacher, parent
or observer assessment of children against a measurable scale, subjecting the results for
statistical analysis to arrive at a measure of a child's social competence.

Whilst families and institutions do provide important contexts for socialisation, the
perspective of developmental psychology has given little credit to the child's ability to form and
shape their interactions away from adults (Goodwin 2006). Corsaro (2003) suggests that the
developmental psychology approach is dominated by adult concerns that fail to see the child
embedded in the context of peer culture:

A big reason that developmental psychologists underestimate the friendship
knowledge and skills of young children is that they focus on outcomes. That is, they
identify and classify children at various stages in the acquisition of adult friendship
knowledge in relation to their age or other developmental abilities. There is an
assumption here that kids must acquire or internalize adult concepts of friendships
before they can really have complex friendship relations. (Corsaro 2003: 67)

Play culture arises from within children's peer networks and develops unique forms of expression
culture thrives where children are given space away from adults to create their own imagined
worlds. Here, the child ‘filters material for its own purposes from what is offered by the dominant
culture’ (Kalliala 2006: 29). Kalliala's observations of children's play highlight the subtlety and
complexity of the emerging play culture, identifying four categories of playing (after Callois 1961):

**Competition and games:** Children mutually develop and follow their own seemingly arbitrary
rules. Within this frame, children are expected to apply the rules and to participate actively, but
the idea of winners and losers often gets lost within the play. The most important thing about
these competitive play forms is being a member of the group. There are various degrees of
performance within these games, with subtle interventions of ‘dizziness’ (see below) to add to the play. The significant feature is that children are in control of this process.

**Games of chance:** Kalliala highlights the significant element of chance in children’s play culture, typified by the use of rhymes to select and eliminate others in play situations. These forms represent a strong ritualistic element in play and can be used as a way of resolving conflict without resorting to power (even if some players successfully manipulate the result they desire). Kalliala comments that the use of power in play can sometimes be cruel and can exclude others from playing.

**Make-believe:** Kalliala’s observations highlight a range of play forms that imitate real life, involve fantasy and imagination and so on – play based around the notion that the scenario is ‘as if’ rather than ‘for real’. Kalliala distinguishes the domestic, reality-based pretend and role-play situations from scenarios that are about having adventures and fights. She describes the intricacies of children’s ‘real-life’ pretend play, particularly the imitation of much of their daily family routines and exploration of domestic and gendered roles. In contrast, the fantasy and adventure type of pretend play features a more structured narrative that can be ‘funny, full of surprises, exciting, big or small’ (Kalliala 2006: 75). A common theme in children’s adventures and fantasy play appears to be the battle between good and evil. In her observations of children’s play, Kalliala suggests that this represents an important part of identity formation; in order to come to terms with a complex and nuanced sense of ‘right’ and ‘wrong’, children first need to play at fighting between clearly defined good and evil.

**Dizzy play:** The momentary need to turn the world upside down, to lose control in an attempt to regain equilibrium. Much of this play includes ‘forbidden’ elements, often associated with disgust, toilet humour or sex, along with a range of risk-taking physical actions. As Kalliala points out, these forms of play are situated in time and place, drawing on the dominant cultural themes that currently concern children. Here again, we may see connections with Sutton-Smith’s (2003) analysis and the role of play in emotion regulation.

It is apparent that adults often perceive many of the expressions which children display while playing as trivial or undesirable. Adults generally perceive children’s play from a purposeful and functional perspective and regard children’s expressions as childish nonsense and perhaps as noisy and chaotic (Mouritsen 1998). Adults often misread the nature of children’s play evidenced, for example, by Smith and others’ (2002) research with teacher interpretations of children’s rough and tumble play and their misperceptions of this form of play compared with children’s own interpretations (Smith and others 2004).

‘Play culture arises from within children’s peer networks and develops unique forms of expression.’
While adults may perceive certain forms of children's play as threatening, disruptive or having no benefits (Smith and others 2002), children certainly do not perceive these as unimportant. As Sutton-Smith (2001: 43) suggests, 'while the adult group typically exercises much pressure to have children adhere to the culture's stereotypic belief systems, in many modern cases children's own imaginings far transgress the implications of these systems and pursue phantasmagorical routes of their own'.

Guss (2005), through her examination of children's narrative in a pretend play situation, indicates that children's pretence is not simply an imitation of the real world but is highly innovative. Thus, children's pretend play may be subversive rather than simply being socially integrative. Guss asserts that play has the potential for inverting the established order and creating new cultural norms. In this way play can be:

... both generative and expressive of personality and culture. Generating and expressing personality and culture have to do with giving form to and forming individual and cultural identities. (Guss 2005:241)

Equally Pramling, Samuelsson and Johansson (2006), reviewing the literature on children's play and learning, note that in play children experience and create a world of meaning that contains its own values. Children share their life-worlds with other children; the maintenance of play requires continuous negotiation and renegotiation between children. As they explain:

Since children interact on equal conditions while the situations and the participants often change, there is no absolute right or wrong in children's play worlds. Instead rules must constantly be defined and redefined. This makes play a perfect arena for children, in which they will develop communicative ability, an ability ... fundamental for children's learning and creativity. In play, children learn to know others' perspectives and gradually learn to understand them. (Pramling, Samuelsson and Johansson 2006: 51)

Guss (2005: 233) reports that children, when left to their own devices, have 'serious fun' playing as 'they seek and construct form and meanings that have immediate significance for them'.

Guss' (2005:242) critique of the instrumental perspective leads to an alternative approach which acknowledges that children, through their dramatic play, gain 'powerful tools for self-defining experiences of themselves and for forging enriched identities'. Through their initiation and development of play, and in the privacy of their play culture:

... children also have the cultural occasion, space and liberty to take control: to question, to speak for themselves, to represent, transform and define themselves, and to choose and to reach the aesthetic effect that satisfies their imaginations and complex wishes. In the cultural contexts of children's playing ... the players can experiment with standpoints, redefine their identities and, thereby, take back their power of self-definition. (Guss 2005: 240)

The complexity of children's play cultures
Corsaro's (2003) exploration of children's friendships and peer cultures begins with an acknowledgement that children are active agents in their own socialisation and take information from the adult world to produce their own complex and dynamic childhood culture. Any attempt to understand the meanings of play must begin with the child's subjective experiences. A closer exploration of the complexity and dynamism may show that play is not simply about pleasurable experiences (although as previously discussed this does have a significant place in play) but will inevitably contain painful experiences, rejection, isolation, fear, cruelty and so on (Hughes 2006; Sutton-Smith 2003). Bailey (2002: 165) notes that children's social transactions are 'by turns co-operative, competitive and manipulative: networks of friendships are formed and reformed; compromises are made; plans are drawn, redrawn and withdrawn'.

A similar point is made by Lofdahl and Hagglund (2006), who note that a 'romantic' view of children's play does not reveal the complete nature of this form of behaviour; play is also a social
arena for negative, difficult, and sometimes hurtful lessons and accompanying emotions. Using empirical data from a study of schoolchildren's play, Lofdahl and Hagglund demonstrate how children interpret adult determined rules within the setting to establish their own hierarchical and exclusionary play group. To legitimise exclusive practices, children manipulated school expectations, such as 'everyone can join in'. Through a highly complex process, children verbally and non-verbally participate in establishing common rules for inclusion and exclusion both within the play through the allocation of roles, and externally by ‘inventing’ rules of exclusion – ‘you are too young’, or changing selection rituals in turn-taking games. As the authors note:

**Over time, this kind of experience constitutes an important element in children's ongoing learning of basic conditions for being socially accepted and included. In a longer perspective we anticipate this to have bearing also for their insights of social participation and its cultural meanings and conditions in a more general sense.** (Lofdahl and Hagglund 2006: 192)

In their observations, Lofdahl and Hagglund note that the intervention of a teacher to enforce the rule that every child can join in did little to support an excluded child. While complying with the teacher's request, the children allocated a lowly role in the play which meant that the child was physically included but no one need pay any attention to her.

Wohlwend's (2004) study of children in a school playground notes the complex ways in which children include and exclude each other in their social and play groupings and concludes that the solutions to these situations lay not so much with teacher initiated discussions but within the play process itself, and the dynamic nature of children's play groups created plentiful opportunity for strategies to change memberships or introduce innovation into the play to accommodate or exclude others.

Branco (2005) explores the nature of conflict in children's peer play and notes that research indicates the value of these experiences to questioning assumptions and attempting to see others' perspectives. Through this process, children increase their communication and meaning construction abilities. Where there are divergences in play, children may co-create and construct new meanings in order to keep the play flowing, which 'results in novel verbal and non-verbal elaborations that directly contribute to their linguistic abilities' (Branco 2005: 423).

**Children's subjectivity and identity**
De Castro (2004: 476), citing Alanen (2001a: 87), notes that through:

… participation in everyday social life, children … gain a particular range of experiences and knowledge about the social relations within which they daily live, on the locations which are theirs. This knowledge, however, is normally not articulated and therefore remains hidden, implicit, unacknowledged. Beginning from where children stand and act, as subjects, in their everyday lives, an account of society from such a point – that is, from a children's standpoint – becomes conceivable.

The emerging disciplines of the sociology of childhood and children's social and cultural geographies have provided rich material which begins to consider the significance of children's peer friendships and relationships, largely from the subjective and situated experiences of children. From this perspective, it is acknowledged that children actively negotiate aspects of their identities as they align themselves with ‘others’ in places that hold multiple and shifting meanings (Vanderbeck and Dunkley 2003).

This emerging body of work perceives children not as a universal phenomenon, subject to a pervasive all-embracing theory (such as that of fixed ages and stages of development), but as producers of subjectivities that are uniquely intertwined with their material and discursive worlds. Each human being lives within a web of social relationships that make up their ‘community’, all the while developing a set of identities that influence and are in turn influenced by these networks.
Children's playful encounters may be seen as a vital element in the process of identity making; a significant process in which children continually construct their identities in a range of diverse social and physical landscapes (De Castro 2004; Goodwin 2006). The variability of places and people provides 'fluidity and plasticity in the process of engendering and reconstructing frontiers between one and the other' (De Castro 2004: 476). A vital link in this process is through the peer relationships that develop and fragment away from the gaze of adults. Valentine (2000) comments on the need for children and young people to learn how to articulate their individuality while at the same time fitting in with peer group identities. This delicate balancing act is 'complex and fragmentary' and requires constant 'maintenance work' on the self to manage the necessary choices that are made in differing contexts (Valentine 2000: 265).

A number of ethnographic studies have revealed the intricacies of this balancing act in the situated activities of children's lives, highlighting how children's peer friendships are arenas for developmental psychology, this perspective suggests that boys and girls have distinctive cultures that manifest themselves in their play styles. These separate cultures provide the socialising influences for boys and girls as they grow older (Underwood 2007). Rose and Rudolph's (2006) critical review of research evidence concludes that there are some consistent differences in the styles and experiences of girls and boys with their same-sex peer groups. Girls engage in more prosocial interactions, evidenced in their conversations and self-disclosure. Also girls are more likely to focus on the importance of maintaining connections, are more sensitive to distress in others and to the status of their peer friendships, and display their emotions more openly. Rose and Rudolph (2006) suggest that boys, in contrast, interact in larger groups, engage in more rough and tumble and competitive play, emphasise dominance goals and self-interest, are more likely to experience direct physical and verbal victimisation and are more likely to use humour in response to stress.

Pellegrini and others' (2004) research into the gendered nature of children's play in school playgrounds in the UK and US reveals evidence of this 'two cultures' pattern. Their findings suggest that boys engaged in more games, in particular ball games, and chase games, than girls. Girls engaged in more jumping/verbal games, such as jump rope and clapping/chanting games. They suggest that these differences in play behaviours may be a reflection of the ways in which boys use the available space for their physical and competitive behaviours. Pellegrini and others suggest that girls are more sedentary and more verbally competent than boys. As such, girls preferred games in which these skills could be used. The research concludes that peer groups support gender role stereotypes; girls find the playground unpleasant, citing research from Blatchford (1998) which suggests that girls complain that their playtime is too long, and look for ways to opt out of going outside.

Jarvis' (2007) study of rough and tumble play with children in a primary school in the north of England suggests that boys engaged more frequently in rough and tumble play. Of the 33 observations of rough and tumble play behaviours, only four featured girls-only groups, while in contrast 15 boys-only episodes were observed. The boys displayed more physical confrontation and less complex narratives and language than were observed in the girl's-only episodes. However, there were 14 examples of mixed-gender rough and tumble play. The significant
proportion were chasing games that were initiated by the girls. This generally involved girls seeking out a boy to offer an invitation, or ‘play cue’ (Sturrock and Else 1998) to chase them. The games developed with an underlying narrative that involved the boys pretending to be a frightening monster and the girls running away. Another chase game observed by Jarvis was the ‘poison touch’ game, where girls, once touched by a chasing boy had to lie down and ‘play dead’ until another girl’s touch brought them back to life. Jarvis notes that a feature of the girls’ reactions to chasing games was to ‘tell the teacher’ when the boys’ attention became too energetic, and the style of this ‘telling’ could evoke different responses from teachers. Girls’ ‘routine’ complaints were often seen to be part of the fun for both girls and boys, and would result in a mild admonishment from the teacher that reinforced the boy’s status as a good chaser. However, more serious transgressions would lead to more severe and less desirable admonishments. When they sensed that girls were going to tell and that the consequences might be severe, boys ‘collaborated in an attempt to persuade the girls not to tell’ (Jarvis 2007:185). This process of ‘telling’ signifies the exertion of a certain amount of power by the girls within the play. Jarvis notes that there is a complex web of inter- and intra-gender cooperation and competition within rough and tumble play that supports learning about ‘complex physical and linguistic responses from other children of both genders, allowing the children concerned to create shared narratives through which they can practice independently controlled and motivated behaviour … within the peer group, whether they are male and female’ (Jarvis 2007:186).

Aydt and Corsaro (2003) also comment that in research with young children in Italy, while there was evidence of traditional same sex-activities for boys (sports and superhero play) and girls (dolls), both girls and boys participated in role-playing games, in particular one game based on television game show in which both boys and girls took the role of the main character, a woman, demonstrating the flexible ways in which children can deal with gender issues in play. Their research into gender patterns across different cultures notes that:

Examination of children’s interactions across four different preschool settings demonstrates that although there are some similarities in cross-sex play, the salience of gender and the quality of interaction varies substantially from peer culture to peer culture. Although at least some level of gender segregation seems to be a universal feature in children’s play, some peer cultures emphasize gender differences and ritualize cross-sex interactions and in other peer cultures, children do very little to enforce gender boundaries. (Aydt and Corsaro 2003: 1320)

These examples indicate a more complex pattern to children’s gendered play than the ‘two cultures’ research suggests. Goodwin (2006) questions the perspective of the ‘two cultures’ approach and associated methodologies. The emphasis on experimental psychological studies rather than ethnographic accounts of children’s situated relationships and activities has given rise to essentialist ideas. This is further reinforced by the fact that many studies are of white middle-class children which are then generalised to make universal claims about all children. The focus on difference in morality, emotionality and prosocial behaviour associated with the binary of male/female groups masks the multiple ways in which children negotiate the rules of behaviour within their peer societies and leaves little room to accommodate the changing power relations as they occur in time and space. Goodwin’s detailed linguistic analysis of children’s play in a US elementary school playground calls into question the notion that girls groups are prosocial, cooperative and polite. The girls in Goodwin’s study displayed complex ways of delineating social difference within their groups and used subtle and more direct verbal and non-verbal directives to construct hierarchically organised relationships in both same-sex and in cross-sex play.

Swain (2005), citing the work of Thorne (1993), recognises that the binary language of ‘boy’ and ‘girl’ hides the fact that there is a greater variation within gender than across it. Boys and girls, at times, are separate (or are separated) within their groups, but they also come together to be part of the same world. One significant site for the separation and coming together of children is the school, an institution that generally features a dominant or exemplary form of masculinity (Swain 2005), often referred to as ‘hegemonic masculinity.’ The dominant
masculine practices, norms and values that pervade these institutional spaces afford boys the opportunity to exert their influence – although as in previous discussion it should be recognised that this takes place within the context of the other intersecting features of class, ethnicity and so on. Swain’s research in three contrasting primary schools highlights the ways in which boys draw significantly on their physicality and athleticism, inextricably linked to the body in forms of ‘strength, toughness, power, skill, fitness, speed and so on’ (Swain 2005: 77) as an expression of their masculinity. Masculinity is relationally produced and, as Swain comments, masculinity is always defined in relation to what is not masculine, namely, femininity.

The study notes that the nature of gendered relationships differed in each of the schools, but there were also a number of similarities, chief of which was that while children preferred to play in same-gender groups, these were generally not oppositional but complementary – boys did not generally need to resort to misogyny to reinforce their masculinity. What is apparent from the research is the dynamic, often subtle, and multiple ways in which children maintain and cross over gender divides. Swain cites an example from one school where boys and girls regularly played together in the playground, even in physical strength games. In the other schools, boys tended to dominate the use of playground space but this situation was contested by groups of girls who were able to deliberately exercise power over the boys.

Renold’s (2004) study of how ‘other’ boys negotiate non-hegemonic masculinities in a primary school further extends the complexity of gender relationships. The choices for ‘doing boy’ are not simply about exercising personal preferences but must take into account the wider context; boys who move outside of the dominant masculine identity may place themselves in a position of powerlessness and exposure to ridicule and isolation. Renold highlights how the majority of boys interviewed expressed some concern over the pressures of hegemonic masculinity maintenance, and one third of the boys were ‘struggling to do their gender in non-hegemonic ways’ (Renold 2004: 261). In seeking to move away from a prevailing masculine hegemony, children would try out (‘flirt’) with non-hegemonic roles. To prevent sanction and ridicule from male peers, this flirting would still take place in a framework of dismissal of all things feminine. As Renold (2004: 261) notes, ‘they had little awareness that investing in such discourses reinforced the very powers of hegemonic masculinities that they were trying to escape from’.

Epstein and others’ (2001) ethnographic study of children’s play in two primary schools notes different ways in which boys carry out the task of performing masculinity in their play. However, this is also informed by processes of ethnicity and sexuality. In one of the schools used in the study, playtime was dominated by the boys’ football games, with the girls standing around the edges of the playing areas and framing the boys’ games.

This observation is consistent with a number of other studies that have paid particular attention to the role of playground football in providing boys with a set of masculinising practices that are based almost entirely on physicality and embodied social action (see, for example, Smith 2007; Clark and Paechter 2007). The performance of ‘football’ offers a highly visible platform to display competence in an activity that personifies masculinity. Clark and Paechter’s (2007) study of 10- to 11-year-olds’ use of the school playground in two primary schools in London illustrates the ways in which boys’ games of football lead to domination of the playground space and activity: ‘gendered expectations about play and the use of the body serve actively to discourage girls whist consolidating male dominance of the game’ (Clark and Paechter 2007: 262). A complex and interrelated series of behaviours and practices serve to exclude girls and marginalise non-footballing boys, including the legitimisation of this practice by teachers through ‘cultural complicity’ (Newman and others 2006; Smith 2007).

Epstein and others’ (2001) study notes that girls spent much of their time appearing not to be interested in the boys, but talking about them, particularly in terms of their skills as footballers and their attractiveness. These discussions often spilled over into the skipping and clapping games played by the girls. The second school had a more identified space for playing football in the playground (the ‘cage’), and the use of this space was prescribed by teachers with each year of the school allowed to use it on a separate day of the week, with one day being dedicated to girls only use. This not only established a pattern of girls playing football, which spilled over
into girls playing in the ‘cage’ on their ‘year days’, but also created opportunities for play beyond football. The observations indicate that boys developed chasing and wrestling games, but also played with the girls in a largely girl-initiated and maintained role-play situation (significantly arising from the most popular girl and boy being ‘boyfriend’ and ‘girlfriend’ and wanting to play together, thus giving ‘permission’ for this form of behaviour to other boys). Epstein and others (2001: 170) conclude that:

Children’s enactments and embodiments of gendered, ethnicised, and sexualised subject positions are more fluid than commonly appears to be the case in school playgrounds … Here we can see the possibilities of more fluid, hopeful, and less rigidly policed and disciplined masculinities and femininities that accrue from girls and boys having mixed friendship groups at this age.

Renold’s (2007) research with 10- to 11-year-old children in a school in the east of England suggests that the dominant discourse of heterosexuality reinforces masculine hegemony. Her study shows how the ‘heterosexual norms’ associated with being boy and girl are continually negotiated, mainly through the practices of ‘going out’, ‘dumping’ and ‘fancying’. These states rarely involved actual encounter or going anywhere as a couple but were positions playfully adopted to create subjects of ‘boyfriend’ and ‘girlfriend’. Girls played a key role in developing and maintaining boyfriend/girlfriend cultures ‘via complex interactive daily gossip networks, matchmakers and messengers’ (Renold 2007: 282). The position of being a boyfriend was a key signifier of heterosexual masculinity while the performance of being a girlfriend was also a fundamental construction of what Renold refers to as ‘proper’ femininity.

While the process of having a girlfriend/being a boyfriend was valued as contributing to boys’ masculinity, it paradoxically also created tension and anxiety by challenging other expressions of masculine hegemony created through an aversion to and disassociation from all things feminine. This tension often became apparent in the teasing patterns of behaviour that boys adopted when talking about girlfriends (largely oppressive and misogynistic). While most of the boyfriend/girlfriend relationships were ambiguous and fleeting, Renold develops a more detailed examination of the ‘professional’ boyfriend role – children who moved beyond the tension to adopt various ways of developing closer friendships with girls without loss of masculinity. This supports Epstein and others’ (2001) observations of the modelling of boyfriend/girlfriend roles by popular and high status children which creates the opportunity for closer boy/girl friendships. This research highlights how the intersection of gender and sexuality gives rise to the highly complex and nuanced positions and behaviours that children adopt in their relationships.

Tellingly, most of the research on gendered relationships occurs in school settings, primarily in the playground. The separation of boys and girls tends to be greater in schools than in the neighbourhood, where children often play with anyone they can find and there is more chance to create spaces to play away from the sometimes admonishing observations of others (Swain 2005). James (1998) recalls an interview with a young child, Alice, who when asked the question ‘Do you play with boys?’ responded that she played with Bobby at home and on the way to school, but this friendship was put on hold at the school gate. On the journey home after school, the friendship was renewed. Equally, children’s play relationships in their local neighbourhoods may differ significantly from those in school playgrounds. Meire (2007) cites the work of Ackerley (2003) who observes that the strict gender separation seen in school playgrounds was not replicated in children’s other play spaces, for example, the home and the neighbourhood. Ackerley suggests that gender integration is more likely to occur without adult intervention, and thus in (rarely studied) settings like the street and the neighbourhood. This again highlights one of the key dilemmas in this research review and the relative paucity of research materials that explore children’s play away from the school playground.

It should be acknowledged that gender, race and class intersect with space to produce patterns of territorial claims, as evidenced in the school playground research which illustrates the ways in which boys dominate the use of playground space. Morrow (2006) summarises the key findings from research which suggests that gender differences have a significant impact
on children's use of space. Overall, research suggests that girls are more restricted than boys in where they can go.

Karsten's (2003) study of children's use of a neighbourhood playground in Amsterdam provides one of the few detailed ethnographic studies of children's play outside of the school playground. The starting point for the research is the recognition of the importance of 'access' to these informal sites of play. A child's ability to access these spaces will be a reflection of interest/disinterest, their perception of the space and their ability to enter such sites. Karsten cites the work of Loflund (1985) who suggested that people living in cities try to reduce the complexities of living in a world of strangers. One method used to reduce this tension is to create 'home territories', a colonisation of the public spaces. Thomson (2005) notes that territorialisation is about possession of an area, and through this possession one is able to say to 'others' that 'this is our space, not yours'. This colonisation is achieved through getting to know the place and establishing 'residency', a situation in which children acquire sufficient knowledge about the social, physical and cultural characteristics of a place to change status from visitor to resident.

The notion of 'resident', according to Karsten, involves a number of key interrelated features. Thus, residents invest time in their places and as they spend time, they establish broad networks with other residents which become 'powerful resources that residents use to dictate the rules and defend their territory against outsiders' (Karsten 2003: 459). Residents also develop forms of communication that become exclusive; non-residents do not understand the language and rituals. Accompanying this, residents claim and assert 'property rights' over spaces and resources, simply justified by the fact that they are the residents in this space. Karsten (2003: 459) notes:

**Behaving like a resident would, of course, be impossible without at least tacit consent of the other visitors. In many cases, visitors take the colonizing behaviour for granted as long as they can use the place for a specific function. Thus children in the playground will tolerate the culture of the residents as long as they can play themselves. However, the kind of play may well be influenced by the behaviour of the residents. And the simple presence of a group of residents may prevent other children from visiting a playground.**

Karsten's research identified some dominant themes of gendered access and participation in the residential play spaces, particularly across themes of presence, activity, space and time. The conclusion to the study highlighted the fact that in general girls are 'somewhat marginalized' within the residential play spaces.

**Boys outnumbered girls not only in frequency of participation but also in duration of time and in the size of the network and territory they controlled. This helped boys to obtain intimate knowledge of the playground which – in turn – reinforced their more frequent status as resident. Girls as a group were less visible, which made it more difficult for them to obtain this status.**

While this was a general pattern, there was significant variety across space and time. Karsten notes that some girls with resident status were encountered in nearly every playground; and they used this position to dominate others and take a lead in organising games, allocating roles and manipulating rules and players to meet their own needs and to maintain status.

**Beyond gender**

In contrast to the considerable research into children's gender friendships and play, there is less research that pays direct attention to the influences of other sociocultural processes on children's play and identity. As Reay and Lucey (2000) comment, children's understandings of and relationships to local spaces are shaped by broader social relations in which class and race are just as potent as gender.

Meire (2007) notes play is valued differently among different cultures. Goncu and others (2000) comment that the prevailing developmental approach to the study of children's play in the Western world has led to an implicit presumption of universal patterns of play. Cross-cultural
studies have questioned these assumptions and produced a growing body of evidence which suggests that communities vary in what they see as desirable and valuable for their children’s development, what Sutton-Smith (1999) refers to as the adaptive dialectic of play. Gosso and others’ (2007) study of children’s pretend play across different cultures and locations in Brazil notes that the children from high and mixed socio-economic urban areas participated in pretend play more frequently than children from low socio-economic regions and a traditional Indian village. The study also reveals a difference in the content of children’s make-believe play episodes, with children from mixed and high socio-economic status areas displaying more fantastic and media related themes, while children from other areas displayed themes that were more closely related to their everyday experiences.

Exploring children’s play in four different communities (urban/rural, Western/non-Western) Goncu and others (2000) conclude that while there are similarities in the forms of play observed, there are also clear differences in the social play episodes and the number of children who engaged in these forms. Overall, Goncu and others’ (2000:328) findings indicate that play will often reflect adults’ beliefs about children’s development and the social structures of the community in which children are located. They also comment on the importance of maintaining a cross cultural perspective and looking at children’s play as part of the wider social and cultural networks within specific communities before proffering observations and conclusive statements about children’s play patterns.

A number of studies have considered the influence of social class on children’s play patterns (Lareau 2000; Tomanovic 2004; Ziviani and others 2007). Tomanovic’s (2004) study of children and family life in Serbia adopts a ‘lifestyle’ framework in exploring the relationship between family socio-economic status and children’s interactions within the home and in the wider neighbourhood. Tomanovic (2004: 343) explains that the family acts as ‘one of the basic arenas of action for the child [and sets] the structural and interactional frames for the everyday practice of childhood’. The research compares family practices across working class and middle class families and notes the ways in which working class families organise practices centred on the home and family, leisure time was seen as informal, following routine patterns that chiefly concerned socialising with others. The middle class families produced highly structured use of family time, often spent in institutions and spaces that were regulated by adults, and consequently less time was available for free, self-initiated and self-organised activities. Tomanovic (2004: 354) concludes that the lives of the working class children in the study were orientated to ‘a greater extent to family, the home, and the neighbourhood, with routine everyday schedules and social networks comprising family members, relatives, peers drawn from the neighbourhood and from school’. This contrasted with the middle class lifestyle in which children were orientated to spaces and institutions where time

'[There are] different patterns that middle class and working class families establish for the organisation of children’s leisure time.’
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was more organised and their social networks more diverse. Tomanovic asserts that the differing lifestyles established contrasting forms of social and cultural capital, which in turn constructed different childhood practices.

Lareau’s (2000) ethnographic study in the US of white and African-American children aged between 7 and 10 years largely supports Tomanovic’s observations of the different patterns that middle class and working class families establish for the organisation of children’s leisure time, and notes that in terms of the structure of children’s daily lives ‘class appears to have a more dramatic impact than racialised ethnicity’ (Lareau 2000: 156). Lareau’s review of the research into children’s daily experiences summarised the more adult structured and controlled activities associated with middle class children compared with less pressured and more relaxed patterns of working class children and raised the question about the acquisition of ‘cultural capital’ (Bourdieu 1984) through these differing childhood experiences.

Compared with their working class counterparts, the middle-class children in this study have been in a wider variety of situations, often with more opportunities to perform and to gain experiences and expertise. It is possible that these differences in childhood experiences can provide different repertoires for them to draw on as they move into adulthood. (Lareau 2000: 169)

Both Tomanovic and Lareau adopt a macro, structural perspective to their research (that is, looking at the influences of broad social structures on children). Alternative studies have considered the ways in which children, as active agents, negotiate their ways through working class environments, often portrayed as ‘ghettos’ and given other stereotypical descriptions by the media, compared with children from middle class areas.

Reay and Lucey (2000), in their study of the feelings of 9- to 11-year-old children about living on a large council estate, note that the responses of the children counter the perceptions of these sites as ‘hopeless’:

The realities of children’s lives on large council estates are far more complex and nuanced than … media depictions suggest. Far from ‘not caring’, they have relationships to the places in which they live that are characterised by ambivalence and conflicting feelings of longing, belonging and abhorrence.

The research notes that children from working class families are knowledgeable agents with a rich store of real and mythic information about where they live. These ‘topographies of the public and the private, the foreign and the familiar are powerfully classed, gendered and racialized’ (Reay and Lucey 2002: 412). Interviews indicate that, in spite of the media portrayal of their neighbourhood, children devised tactics to preserve a self-image of decency and respectability and a denial of the fact that they may be poor, findings that were also evident in Sutton and others’ (2007) research into children’s views of social difference. Children’s narratives in Reay and Lucey’s study indicate a rather ambiguous relationship to their estate. Children generally viewed their estates as hostile social landscapes with the familiar patterns of alcohol and drug use, violence, vandalism and so on. In order to cope with this, children and families sometimes resorted to ‘keeping to yourself’ and avoidance strategies. Yet, as previously outlined, such strategies may not be effective in the development of resilience at a community level (Van der Hoek 2005). As Reay and Lucey (2000: 421) comment, children need a sense that the environment at some level can be a benign one, can “hold” us while we take the risks involved in growing up. As an act of preserving their self-image of dignity and respectability, children referred to the process of ‘being known’: developing a personal knowledge of ‘others’ who live in the area in order to counteract stereotypes and generate feelings of safety when using public space. This ‘being known’ generated spaces and networks that were more trusted and established a feeling of ‘belonging’. Reay and Lucey (2001: 424) conclude:

Unlike the uniformly depressing, pathologising sentiments about ‘sink’ council estates and their tenants conveyed in both government documentation and media
reports on social exclusion, the children we interviewed communicated a far greater sense of both hope and survival. While prevailing dominant discourses tend to deny children and their families both agency and potential, the children themselves talked endlessly about hopes aspirations and desires. They also spoke of a need, not to find a better place, but to make the place they find themselves in better.

Sutton and others (2007), in their comparative study of children from a council estate and a middle class area, note the different ways children constructed their use of space and time. For many children from the middle class area, out of school activity, generally associated with ‘education’, was wider (both geographically and in terms of activities) and more expensive compared with children from the working class estate who reported spending more time ‘hanging out’ with friends in the neighbourhood rather than taking part in structured, adult organised activity. This concurs with Ziviani and others’ (2007) research in Australia which notes that children from low socio-economic backgrounds spent significantly more time playing close to their homes than middle class children, who engaged in more structured and costly activities.

Sutton and others (2007) highlight the ways in which children’s use of public space in the estate often consisted of playful activity – knock-a-door run, manhunt, kickstone – games that have a strong tradition and high value in children’s play cultures. Yet their visibility in public space often created tension with neighbours and other adults, and they were often moved on by police if they assembled in groups. The loss of opportunity to meet with friends and ‘become known’ in public space drives children indoors, where there may be further tensions.

Children’s play culture and technology

An example of the ways in which children appropriate and transform adult cultural forms may be seen through children’s playful use of modern technology. Valentine and Holloway (2002) note that Information and Communication Technology (ICT) is bringing about, and will continue to bring about, widespread social, cultural, economic and political change in the 21st century. There are differences in interpreting the impact of this on children, ranging from concerns over the corruption of children and the loss of innocence (Postman 1983) to the positive and empowering role that technology has given to children (Tapscott 1996). Hsi (2007) comments that there is considerable societal concern about children’s and young people’s engagement with media technology, citing such issues as internet addiction, cyber bullying, gambling and exposure to pornography. Yet as Hsi comments, there has been no longitudinal study of children’s cumulative experience of growing up with digital media. Livingstone (2007) draws attention to the lack of serious attention given to children’s relationship with these media. The default position tends to be that children are particularly vulnerable to media influence and that the media harm some children in some ways under certain conditions. This marks a traditional response to the introduction of each new technological medium (from books to the cinema and rock ‘n roll). Livingstone criticises much of the research conducted in the field of children’s relationship with media:

Article after article published on media effects fails to acknowledge the familiar litany of problems, offering little justification for the supposed validity of a dependent measure, showing only short-term effects yet concluding in favour of long-term societal implications, or making no attempt to bring into the research design the many contextual, cultural factors that form part of the complex phenomena studied, factors that may even help explain the persistence of contradictory or null findings. (Livingstone 2007: 7)

Livingstone notes that the media and communications environment is diversifying rapidly, with global, personal, mobile and interactive media raising both old and new questions regarding media influence. In exploring this, it is important to consider the unique nature of individual children’s use of technology, and the multiple factors that contribute to this, rather than rehearse a ‘tired agenda’ of media effect studies that make universal statements about the harm of new media technologies. In many ways, Livingstone’s study parallels similar calls in relation to children’s agency and subjective experiences.
Hsi (2007) reviews the impact of technology on children's daily lives and presents two vignettes based on observations of children, which explore the digital fluency of a 12-year-old boy and a 13-year-old girl in the US. Children use digital tools as part of their everyday routine activities and also to create and exchange messages and artefacts across social networks and online communities.

Sorensen and others' (2007) study of children's computer use in Denmark notes that to a large extent children have taught themselves to make use of the digital media, largely as a result of not being able to get help from other sources, mainly teachers and parents. As such, children have acquired skills through playing and supporting each other in discovering the potential applications of technology. As Sorensen and others (2007: 5) comment, children's use and exploration of the different digital media and communication systems enables them to develop 'new ways of putting the media to use and combining them, and in this context it is very much the case that they make use of new forms of collaboration, communication and learning'.

**Children's use of the internet**

The above introductory themes can be found particularly in relation to children's use of the internet. The discourses on children and ICT contain paradoxical representations of childhood (Holloway and Valentine 2002). These discourses see children on the one hand as technically competent in their use of ICT equipment and programmes, often much more so than adults, yet at the same time, these technical skills are seen to put children at risk through coming into contact with inappropriate materials or people.

In exploring these themes, Valentine and Holloway see a similar pattern in children's access to public space, where children are seen as being vulnerable and at risk, while at the same time their presence may constitute a risk to others. As such, efforts should be made to control and regulate children's access.

A key feature of children's and young people's use of the internet is for social networking, through the use of chat rooms, messenger services and personal pages on social networking websites. Valkenburg and others' (2005) study of 600 nine- to 18-year-olds explored the ways in which children and young people experimented with their identities online. They noted that internet communication has several qualities that lends itself to identity experimentation:

- It has less visual and auditory cues than face-to-face or telephone conversations, and this may encourage users to emphasise, change or hide aspects of their physical self.

- Internet communication is anonymous – particularly in the opening stages of entering a chat room – and this may enable people to feel less inhibited and to disclose certain information knowing that there is little chance of any connection with real life.

- Internet communication often happens in social communities that are isolated from those in real life.

Their study concluded that youngsters in early adolescence experiment with their identity significantly more than older adolescents. In general the younger group use the internet to engage with strangers and play with identity while the older group use it to communicate with their existing offline personal network. Boys and girls did not significantly differ in experimenting with identity but did differ in the strategies used for this. Girls pretended to be older than boys and to be beautiful, while boys adopted more ‘macho’ identities. The most important motive given by young people in internet-based identity experiments was ‘self-exploration’, followed by social compensation (to overcome shyness) and social facilitation (to make friends).

Huffaker and Calvert (2005) acknowledge that older children and young people spend a considerable amount of time using online settings such as multi-user domains, and these have been linked to ways of exploring and playing with identity. One of the newest venues for exploration is the ‘blog’, which is used in a variety of ways, but often as a personal journal or running commentary about oneself. Accompanying this trend is the emergence of online emotional expression through the language of ‘emoticons’ that help to form impressions of the
Chapter 3: The importance of play

interestingly, Huffaker and Calvert’s research on the nature of blogs and identity construction notes that the sites created by males and females are more similar than contrasting. They suggest that the current generation of bloggers may be developing more androgynous styles in online communication and interaction. Kearney (2007) reviews the significant changes that digital technology may be making to traditional patterns of use of domestic spaces. Citing McRobbie and Garber’s (1976: 213) analysis of girls’ bedroom culture as spaces of ‘experimenting with make-up, listening to records, reading the mags, sizing up the boyfriends, chatting, [and] jiving’, Kearney suggests that digital technology enables girls to move from being consumers to producers and distributors of their identities, interests and needs:

in other words, contemporary female youth are not retreating to private spaces; they are reconfiguring such sites to create new publics that can better serve their needs, interests and goals. (Kearney 2007: 138).

Social network sites (SNSs) such as such as MySpace and Facebook allow children and young people to present themselves, articulate their social networks, and establish or maintain connections with others (Ellison and others 2007; Hsi 2007). This growing trend has received little attention in research to date, but Ellison and others’ research with college students in the US suggests that students’ use of Facebook contributed to the maintenance and creation of social capital accompanied by student reports of well-being.

Valentine and Holloway (2002: 316), in the conclusion to their research, comment that use of an internet-connected computer is a different tool for different groups:

For example, for some children it emerges as a tool to develop intimate on-line friendships, while for others it emerges as a tool of sociality that enhances and develops everyday off-line social networks; for some it emerges as an important tool for developing off-line hobbies, and for others as a casual tool for larking around … Our findings counter popular fears articulated by commentators … that ICT will impact on children’s lives in either universally positive or universally negative ways.

‘A key feature of children’s and young people’s use of the internet is for social networking, through the use of chat rooms, messenger services and personal pages on social networking websites.’
Children's game playing
Dovey (2007) draws a comparison between children's play in the 'mediasphere' and the human need to play in other forms of the environment. Children's play with computer games enables children to act out mediated fantasies through winning sports events, surviving against monsters, casting spells and so on. This acting out occurs within the zone of play that suspends the rules of everyday life 'in favour of creating a space that allows us to experience the taboo, the challenging, and the passionately desired' (Dovey 2007: 138). Such a media space offers the experience of a wide range of emotions found in other play forms. Taylor (2006) provides a detailed ethnographic account of the complex social landscapes created through multi-player online games, and notes how players negotiate and subvert a game's rules and representations, and collectively articulate and regulate – through on- and off-line play – the practices and protocols of their gaming communities.

Dovey also proposes that playing computer games becomes a learning process. As well as working out the basic game rules and objectives, children are also constantly figuring out how the game engine works, what it wants the player to do and how to test the limits of the game:

... gameplay can be seen as a process of trying to understand, through our developing skill levels, the way that the game works. In this way it is argued that computer game play provides a crucial site for the development and education of our individual 'technicity' where this quality will be a significant part of our subjectivity in the 21st century. (Dovey 2007: 139)

Children's use of mobile phones
Another significant feature of the new technology is the use of mobile phones by children and teenagers. Campbell, writing in The Observer (2005), noted that a survey of children's use of mobile phones revealed that 24 per cent of seven- and eight-year-olds owned a mobile phone, as did 13 per cent of five- and six-year-olds. The survey indicates that the chief use of mobile phones is for texting.

Williams and Williams (2005) propose that the mobile phone affords teenagers increased leverage in bargaining with their parents for greater autonomy and, in doing so, often lifts these negotiations outside the spatial constraints of the household. Yet at the same time teenagers remain under control and surveillance by their parents who use this technology to enter their children's time and space and monitor their movements. As William and Williams (2005: 322) note:

... the parents are able to socially influence the behaviour of their teenagers by potentially being at the end of the phone. Parents are able to keep in contact with their children and to a certain extent control them. Clearly the mobile phone is becoming central to the parent/teenager relationship because it facilitates negotiation and authority outside of the private sphere in a more public arena.

The teenagers studied in Williams and Williams' (2005) research accepted that by putting up with their parents' intrusion, they were in fact more empowered. They could have greater scope for the negotiation of movements, and families often developed an agreed set of rules for communicating individuals' whereabouts. The study concludes with an acknowledgement of the way in which mobile phones have become a vital component in relationships between children and parents.

Maybin (2003) explores the use of texting in young people's friendships. The style of communication between friends allows for a sense of privacy and intimacy. The language of texting is generally owned by young people, although increasingly adults are becoming more familiar with this format. The mobile phone provides children and young people with a cultural artefact that they own through their control over the interactive, flexible, sharing and communicative nature of this technology; they incorporate this into almost every aspect of their daily lives.

Jones and others (2003: 178) note the potential of further developments in mobile technology
to both free and restrict children's movements and access to public space. On the positive side they note that the

... promise of these new technologies is their quintessentially spatial, mobile, outdoor capabilities. They may offer children ways of (re)occupying certain spaces in the city, offering a means of negotiating risk and fear, and of permeating adult-ordered geographies of the city.

Play and language
A key feature of children's play language is that it is often antithetical to the adult perspective of 'correct' language use. As Sutton-Smith (1999: 143) notes:

... the more players play together, the more elliptical and esoteric their dialogue tends to become. They develop their own peculiar argot, which would certainly not score very well on standard measures ... Play is itself a caricatural or schematic activity ... and when it moves verbally it breeds analogous and elliptic usages of language perhaps familiar only to those who are a part of the 'secret' community. Thus the ellipsis may serve to mask what is going on from those who are not members of the play group. Perhaps more important, the ellipsis helps to establish the players as a play community.

Goodwin's (2006) detailed analysis of children's linguistic strategies in peer play interactions highlights the complexity of language use as children become competent social actors. Cumming (2007), reviewing children's play language and the potential application to teaching poetry in the classroom, notes that the oral culture of play as shown in children's rhymes, chants, songs and riddles provides a significant part of friendships and peer interaction. Thomas (2004) presents a detailed analysis of the nature of children's playground poetry, noting that this form of language resists and playfully engages the repressive elements of adult culture and it 'inspires children to construct their own tradition, to compose their own poetry, to teach themselves' (Thomas 2004: 174). Given that the production of this form of poetry occurs away from adult authority figures, much of the material produced is often vulgar, disgusting, violent and funny. Thomas (2004: 155) notes that children's playground poetry:

... dismantles nostalgic notions of the innocent, obedient, and controllable child, and thus, in my experience, tends to disturb adults, as it implies sexualized, complicated child-agents able to control their world through linguistic play and sometimes violent, anti-authoritarian imagery.

Thomas explains that playground poetry is created and performed with the aim of generating a strong body reaction, often using the body as the subject of the poem. Delivery is intended to promote laughter, gasps, groans or more vigorous activity, as in the case of skipping (or 'jump') rope rhymes. Their subject matter perhaps challenges the mind/body dualism through providing a reminder that body and mind are intimately integrated.

Jones' (2004) painting in the Bethnal Green Museum of Childhood, London, and the forthcoming publication of the same name, *The Singing Playground*, shows how many playground songs and games are still a thriving part of playground culture. Some have died out, but others continue to flourish either in their original form or updated with contemporary references; the influences of immigration and ethnic diversity can also be seen, with songs in many languages and cultural fusions between themes and songs. The songs are 'rude, funny, silly, haunting, even surreal ... Silly frogs, boyfriends, marriage, babies, death, scary wolves, wee and farts all figure prominently, and knickers are practically inescapable' (Ward 2007).

Andresen's (2005) empirical investigations of children's role-play in early childhood show that language is a central means of creating pretence, noting that explicit metacommunication (talking and non-verbal language about the play) helps children to work together to establish

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3 Playground poetry refers more to the style and production of this play and language rather than the location of its use.
the central plot of the play, transform meanings and distinguish fiction from reality. Studies of children's rough and tumble play also highlight the significance of metacommunication to establish that the ‘fighting’ is in fact play and not real (Fry 2005).

Drawing on the work of Bateson (1955), Andresen highlights that play is accompanied by metacommunication because the players need to signal continuously to each other that what they are involved in is play. According to Bateson, metacommunication constructs a frame which characterises playing as play, and marks the boundary between behaviour within play and behaviour out of play. This process is essentially paradoxical because on the one hand it states that the behaviour is not serious, but on the other hand, children have to act as if the playful behaviour is real. In early childhood children use communication both implicitly within the play and explicitly by stepping out of the frame to reframe it (‘we’re only playing’). As children grow older, there tends to be a more complex implicit metacommunication pattern within the play; the language used while playing serves the purpose of keeping the play frame established. Andresen notes that this form is more demanding because children must hold in mind planning the plot, transforming, interpreting and communicating meanings, while at the same time carrying out the play. Branco (2005) comments that non-verbal gestures are of central importance in establishing the tone of the play frame and will at times serve to show agreement and affiliation, while at other times will display divergence, hostility and ambiguity. As Branco (2005: 419) notes:

the quality of the frames co-constructed in social interactions are multiple and complex and contain ambivalence and ambiguity as children maintain the play through a range of smiles, frowns, gestures, grins, and an endless list of non-verbal and paralinguistic clues.

Andresen (2005) draws a clear distinction between adult–child and peer pretend play situations. In adult–child play it is invariably the adult who structures the interaction and constructs the play frame within which the child acts. In contrast to this, peer play involves a complex and continuous mutual interaction to negotiate and maintain the play frame and act co-jointly. A similar point is made by Brownell and others (2002) who note that the specific value of peer play resides in the fact that, when playing, children will talk more openly about shared emotions, intentions and inner states than they would with adults.

Sawyer (2003) highlights the many studies that demonstrate how children's metacommunicative skills develop rapidly during the preschool years, both through implicit and explicit means, and suggests that children's pretend play skills may provide an important context for developing general conversational skills. Similarly, Andresen (2005) sees pretend play as a key component in developing complex language and communication skills. Her research with children leads her to suggest that in role play children can transform the meanings of persons, objects and actions through language; this very action enables children to understand that words and symbols have many uses and contexts, ‘a precondition for being able to use language flexibly without being bound to specific contexts’ (Andresen 2005: 409).

Sinha (2005) through a detailed observation of a children's pretend play episode notes the ways in which the playful social interactions are developed through sharing symbolic meanings. The common meanings shared through this process enable the children to renegotiate roles, identity and narrative continually. Thus language serves as a valuable resource for the construction and exploration of self and identity in play.

Summary
This section has explored one of the primary adaptive systems for building resilience, namely, attachment and the development of mutually supportive relationships, both within the family and the wider context of children’s peer friendships.

The research suggests that, from the first stages of growth through to adulthood, play has a central role in developing strong attachments. Play between caregiver and infant helps establish the neural pathways for developing wider attachments with other children and
adults. The ability to establish friendships interconnects with other adaptive systems in highly complex feedback processes; playing with friends builds emotion regulation and, equally, emotion regulation is important to establishing friendships; playing with others is pleasurable and develops positive affect which broadens and builds flexible thinking, enables problem solving, promotes a sense of optimism which all feed back into establishing and enhancing strong friendships within children's peer play groups. The secure attachments within peer play groups afford opportunities to co-create situations of uncertainty and unbalance and work collectively to resolve these, developing flexible stress response systems. The dynamic process of playing with others requires constant maintenance, reading and mirroring the intentions of others and using language forms in highly complex and creative ways.

What this research highlights is that the nature of children's peer relationships and play culture is complex and dynamic. Play culture emerges when children find time and space to be away from adults; as such, this culture is inherently spatial. Yet even though children are away from adults, the influences of the adult world will still inevitably have significance for their relationships and play behaviours. Class, gender, disability, ethnicity and so on work in concert to influence the diverse ways in which children play or indeed are excluded from play, but the act of playing offers a potentiality to transform these wider social forces into new ways of being and construct new identities (Guss 2005). This process also incorporates adaptation and transformation of tools and symbols (technology and language) into new cultural forms and expressions.

The focus in this section has been to explore the nature of attachment and the importance of social relationships. However, as Meire (2007) observes, play does not occur in a vacuum but within a social and physical space. It is important to recognise that the context for children's peer interactions is situated, and the nature of the physical environment combines with the social to create localised spaces for play. Just as friendship and attachment with others support resilience, attachment to the places that children inhabit in their daily lives also allows for the creation of strong adaptive systems. It is this relationship that is explored in the next section of this review.

**Children's play and place attachment**

Active engagement with the outdoor environment presents great benefits. The world is perceived from different angles, giving differing perspectives. Such engagement helps to establish a working knowledge of the environment: recognising physical features and objects, knowing how things connect, realising interactional cause and effect, discovering things, learning what can and cannot be done with others and so on provides a repertoire of flexible responses to the immediate environment (Bateson 2005).

The discipline of environmental psychology is based upon an acceptance that environmental context has a critical role in behaviour and social attitudes (Clark and Uzzell 2006). Children's psychological health and well-being can be enhanced or impaired by the nature of the immediate neighbourhood (Percy-Smith 2002; Jutras and Lepage 2006). In reviewing the research literature into the relationship between brain development and the environment, Lewis (2004: 94) concludes that 'successful engagement with complex environments, particularly early in development, promises to have pervasive and significant effects on brain development and function'. The physical or built environment has come to the forefront of public health research, leading to a surge of research on environmental attributes and their connections with physical activity behaviours (Davison and Lawson 2006).

Dearing (2004), in a longitudinal study with school age children in the US, notes that neighbourhoods influence children through a number of interrelated processes including the range of community resources available (for example play spaces and community centres), social organisation features such as the level of social cohesion within the neighbourhood, and environmental conditions and 'contagions' (harmful or negative aspects).

Neighbourhood conditions are associated with child achievement and socio-emotional functioning. Research into this broad canvas of environment or 'neighbourhood' influence tends to fall into two themes: the first explores the potential harmful impact, or contagion, of negative forces
within the neighbourhood, such as the impact of poverty and the socio-economic level of the neighbourhood, the presence of gangs, vandalism, and general dilapidation within the physical fabric of the neighbourhood. The second theme centres on the positive qualities of children's transactions within their immediate environments, and would suggest that children's well-being is supported by neighbourhoods in which children are able to play and range safely across different spaces, meet friends, observe the world and interact with nature (Chawla 2002). The connection between children and their outdoor neighbourhood places has been closely linked to ways in which children construct their identity (Percy-Smith 2002; Vanderbeck and Dunkley 2003; Wells and Leckies 2005; Matthews and Tucker 2006; Roe 2006). Vanderbeck and Dunkley (2003) highlight the importance of exploring children and young people's subjective accounts of their lives as a way of discovering how children construct their socio-spatial identities and make sense of their experiences as children in relation to the various public narratives that impact on this process.

Jutras and Lepage's (2006) study of parental perception of the local neighbourhood in Montreal indicates that parents placed high value on the child-friendliness of neighbourhoods, availability of playgrounds, the presence of other children to play with and the proximity of parks, playgrounds, school, recreation centres and homes of grandparents. Alongside this, parents valued cleanliness, tranquility, attractive landscapes that facilitated ease of movement and so on. These values have also been commonly expressed by children and young people who tend to view the attractiveness of their local neighbourhoods in terms of what it affords for their activities, both as a physically attractive space and through the opportunity to be with friends (Percy-Smith 2002; Min and Lee 2006).

Research carried out for Playday 2006 notes that 80 per cent of children surveyed expressed a preference for playing outside but not all of them have the chance. Nearly three in four children would like to play out more often, and 82 per cent would rather play in natural spaces such as gardens, parks and local fields instead of places like streets or car parks. The survey also found that 86 per cent of children prefer outdoor activities, including playing out with their friends, building dens and getting muddy, to playing computer games.

Min and Lee's (2006) analysis of children's place transactions in Korea suggests that children form attachments to places in which they can carry out personally valued activities. In their daily neighbourhood experiences, children tend to focus on a few core qualities of a setting, such as being close to home, the availability of play materials and space, and close friends: 'it seems that the children focus on these environmental qualities because they are directly related to some core affordances needed for valued behaviours' (Min and Lee 2006: 69). Where children do not have access to these valued experiences, it is likely that they will place little value on their immediate neighbourhoods. Also, as Fuhrer (2004: 106) comments, children's place transactions will be different from adults', citing the example of a fence between gardens, intended as a barrier by adults but which, from children's perspective, afforded a major attraction and challenge for 'practicing and exhibiting all manner of athletic skills, experimenting with novel ways of transcending it, and of descending down into the landing area'.

**Play in natural spaces**

Lester and Maudsley (2006) provide a comprehensive review of research into the significance of children's playful encounter with natural spaces. The summary of their literature review concludes (Lester and Maudsley 2006: 4):

- Natural environments support a wide range of children's play. The diverse, dynamic and flexible features that can be found in natural spaces afford opportunities for extensive intentional play behaviours.

- Whilst children do not necessarily differentiate between natural and artificial elements in their play, predominantly natural outdoor settings are more likely to be perceived by children as free from adult agendas and thus more open to the possibilities of play.

- Playing in natural spaces offers possibilities for: control and mastery, construction of special spaces, manipulating loose parts, different ways of moving, risk-taking, etc. Childhood
experiences of playing with nature also instil a sense of wonder, stimulating creativity, imagination and symbolic play.

- Children's opportunity to playfully access their immediate natural environments supports the development of a sense of place and attachment. Playing in natural spaces also supports a child's sense of self, allowing children to recognise their independence alongside an interdependence and connectedness with their ecological worlds.

- The powerful combination of a diversity of play experiences and direct contact with nature has direct benefits for children's physical, mental and emotional health. Free play opportunities in natural settings offer possibilities for restoration, and hence, well-being.

- Playful, experiential and interactive contact with nature in childhood is directly correlated with positive environmental sensibility and behaviour in later life.

There is significant research literature that clearly highlights the value children place on natural spaces (Taylor and Kuo 2006; Bingley and Milligan 2004). Evidence reviewed by Taylor and Kuo suggests that engagement with nearby natural places provides restoration from mental fatigue and support for more resilient and co-operative behaviour. Aspects of stronger community life are fostered by access to nature, suggesting that there are significant social as well as physical and psychological benefits from connection with the natural world (Barlett 2005). Kaplan and Kaplan (2005), continuing their extensive research into human connection with nature, suggest that connections to the natural world are restorative and help individuals become clear-headed, resilient and co-operative. This does not simply apply to large expanses of natural space but also to spaces of 'nearby nature' that exist in urban areas.

Taylor and Kuo's (2006) review of research findings also explores the relationship between green spaces and children's play and notes that children play in more creative ways in green space than in built spaces.

Research by Taylor and others (2001) highlights the potential benefits of playful contact with natural space for children with Attention Deficit Disorder (ADD). The research suggests that, compared with the after effects of play in paved outdoor areas, when playing in green spaces

‘Research carried out for Playday 2006 notes that 80 per cent of children surveyed expressed a preference for playing outside but not all of them have the chance.’
children diagnosed with ADD were far more likely to be able to focus, concentrate and pay attention following the experience. The study indicates:

Not only … a strong nature-attention relationship, it also suggests a direction to that relationship. Because this study specifically focuses on attentional functioning after activities, it seems more plausible that participation in green activities causes improved attentional functioning than that improved attentional functioning causes participation in green activities. (Taylor and others 2001: 71)

While the study focused on children with ADD, as a general principle, it is likely that the nature-attention relationship would apply to all children. This gives further support to the considerable literature on the benefits of nature and encounter with the natural world for children.

Bingley and Milligan’s (2004) research with a group of young people highlights the value that the group placed on their childhood natural play spaces. The study notes a positive correlation between where they played as children and the development of strategies for coping with their current issues and concerns. Bingley and Milligan (2004: 68) note that woodland spaces were considered to be of great benefit for many of the young people as they offered spaces of escape, restoration and support to mental health and well-being.

Lohr (2007: 83) suggests that the wealth of research material which addresses the positive benefits arising from nature are astounding; ‘stress is lowered, social interactions are improved, recovery from illness is faster, mental fatigue is reduced, attention is increased, productivity is higher; and violence is reduced’.

Play, place making and place attachment
The creation of a sense of place ‘is important in maintaining the quality of the environment as well as the integrity of human life within it’ (Derr 2002: 126).

Chatterjee (2005) suggests that a child-friendly place is an environment that promotes exploration and actualisation of the potential within local communities for different activities and social interactions; one where there are opportunities for learning about the environment and developing competence through shaping the space by repeated use; and one that ‘allows children to express themselves freely in creation and control of territories and special places; and protects the secrets and activities of children in these childhood places from harm’ (Chatterjee 2005: 17). Chatterjee draws on research into the patterns and qualities of children’s friendship and applies this to relationships with place, highlighting that many of the qualities and benefits associated with strong peer friendships (see previous section) may be evident in children’s attachment to local places. Drawing on research from environmental psychology and environmental behaviour; Chatterjee suggests that children will feel ‘friendship’ for places that support mutual affection, shared interests and action, commitment, self-disclosure and mutual understanding and freedom of expression. Extending this, we may infer that a strong friendship with place will provide protective factors and support resilience in children.

Conversely, it could also be inferred that children who do not have contact with their immediate environment will acquire less local knowledge, giving rise to increased social fears and isolation. This is indeed borne out by Alton and others’ (2007) research with children in Birmingham, which shows that those who walked more, rather than travelling by car, were less likely to be worried about strangers and less likely to report a lack of suitable spaces for playing. Chipuer’s (2001) study of Australian adolescents and their relationship to local places suggests that individuals who do not have a ‘sense of community’ are at greater risk of feelings of social isolation and alienation, which may lead to experiencing loneliness. Chipuer cites a range of studies which indicate that children and adolescents who report higher levels of overall sense of community in both the neighbourhood and school, report lower perceptions of global loneliness and better psychological health. Chipuer’s research concludes that higher levels of neighbourhood activity, friendships, and safety were associated with lower levels of neighbourhood loneliness. Opportunities to become involved with activities within the neighbourhood may provide children with exposure to others with whom they can develop friendships, as well as developing their
own social skills. Engaging in neighbourhood activities can provide children with a supportive environment, with opportunities for social interaction outside the family unit. In turn, becoming involved within the neighbourhood contributes to the development of healthier communities.

Prezza and Picili (2007), in interviews with Italian students recalling their experiences of playing, note that playing in public places exerts a direct influence on a sense of community:

... more autonomy and play in the public areas during childhood influences more intense neighbourhood relations, a stronger sense of community and less fear of crime and, in turn, these latter variables consequently reduce feelings of loneliness during adolescence. (Prezza and Picili 2007: 165)

The authors highlight the ways in which children may develop a sense of relationship with their immediate environment through access to the ‘street’ or informal play space (presence); the possibility of playing in this space (use and action); the sense that this space belongs to the child (appropriation) and the possibility that new children can join in and create their own spaces (disposition).

Derr (2002; 2006) provides a detailed analysis of the key components associated with children’s emerging sense of place. Beginning with the recognition that children shape their own place experiences through ongoing interactions and transformations, Derr’s research with 9-11-year-old children in New Mexico highlights the complexity of their relationship with their immediate environments as it occurs at multiple levels.

Derr’s four themes are summarised below:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
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<tbody>
<tr>
<td>Four wheelers, ramps and rites of passage</td>
<td>Children learn through adventure, risk-taking, exploration and self-created rites of passage. Experiential needs greater than place attachments.</td>
</tr>
<tr>
<td>The fort makers</td>
<td>Children experience imagination, escape, safety and creativity through active place-making and place attachment. Place and place-making integral to the experience.</td>
</tr>
<tr>
<td>Learning care</td>
<td>Children learn nurturance, companionship, respect, awe from animals, ethnobotany, gardening and place. Elements of nature help children to model care for larger scale.</td>
</tr>
<tr>
<td>The web</td>
<td>Experience of a cultural place, reasons to stay, reasons to go, rootedness and transience. Context for experience influences the meanings children attach to place.</td>
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Derr’s analysis provides a useful framework for placing recent research into the significance of children’s relationship with their local environments.

**Four wheeler, ramps and rites of passage**

At the micro level, the child-scale experience of place is developed through play activities and explorations with friends. Derr refers to this as a ‘rites of passage’ period in which children seek to develop mastery over their environment in order to become self-sufficient in using the available affordances. Exploration offers the chance to ‘expand their view of the world, to test boundaries, and sometimes incorporate these physical experiences with place into their sense of identity’ (Derr 2006: 110). Bell (2006) maintains that direct interaction afforded by local spaces is how children build mental representations of space. Cornell and others’ (2001) study of children’s wayfaring strategies suggests that the foundation for the development of complex cognitive skills is established in the relatively small scale of their neighbourhood play.
While parents or peers may initially introduce children into the local network, as children become older they extend their spatial knowledge through ranging further and also by wandering and exploring beyond the ‘paths’. These extensions of range provide the ‘motivation and proving older they extend their spatial knowledge through ranging further and also by wandering and exploring beyond the ‘paths’. These extensions of range provide the ‘motivation and proving grounds for way finding strategies’ (Cornell and others 2001: 220). Cornell and Hill (2006) note that parents establish range boundaries for children, often reinforced by myths and stories that are designed to inhibit children from going beyond the set limits. However, research would suggest that children do not always follow these prescriptions and proscriptions, but develop a series of strategies both for extending the home range and for developing skills in negotiating their way around unfamiliar territory (Valentine 2004; Eisley 2004).

Roe's (2006) study of children's play patterns highlights the complexity of the process of establishing boundary definitions, a reflection of individual, familial and sociocultural factors influencing decisions. For the parents in her study, the key issue influencing ranging restrictions was concern over child safety.

In reviewing their research findings, Cornell and others (2001) highlight the significance of children's ‘off-path’ adventures for the development of problem solving strategies. Such adventures contain 'elements of risk, happenstance and wonder’, and the challenge for children is to assess the new situation and develop successful responses. Wandering off the path means entering areas of uncertainty and the adventurer has to adopt an open-mind to planning and decision-making. The authors suggest that further exploration of these strategies may be useful:

> In adventure, adults and convention are not setting the goals and activities are unsupervised. These circumstances are different than arrangements for school curricula; studies of children responding to task demands in natural contexts may help us understand their strategic adjustments within arithmetic, spelling, and other formal problem domains. (Cornell and others 2001: 229)

A common theme to this playing and exploration was the seeking out of natural places, whether in remote wild spaces, in rural areas or close-to-home nature in urban areas.

**Fort makers**

In contrast to exploring and widening territorial range, another aspect of children's developing a sense of place relates to a more introspective process of creating special places. Derr's analysis of this feature finds support from European studies into its significance for children (Sobel 2002; Chawla 2002; Korpela and others 2002; Kylin 2003). In the New Mexico study, Derr remarks on the less than romantic construction of these places, often using found scrap resources and random materials, although these may frequently be decorated with natural elements, investing them with creativity and imagination.

Korpela and others (2002: 387) present the role of self-regulation as a process of maintaining balance between pleasant and unpleasant emotions, and a key part of this process is through environmental considerations:

> Environmental strategies of self-regulation involve the use of places and place cognitions and affects. Just as attachments to one's parents or friends represent social strategies of self-regulation ... place attachments represent environmental strategies. Indeed a person may become attached to a place because it supports self-regulation, in part by enabling positive emotional changes and renewal of cognitive capacities needed to process events that challenge self-experience. Such changes characterise restorative experiences.

Kylin's (2003) study of den making in Sweden notes that the most interesting part of children's experiences and understandings of dens is the dual nature of the den as a social place and a secret place, where one does not exclude the other. The very notion of children creating special places raises a problem for planning of children's spaces. As Kylin comments, there may be some tension between what adults find desirable in outdoor public spaces, and children's needs. Many planners and other adults emphasise the visual aesthetic appearance, while the child
places more value on what it affords for their play. It is reasonable to ask whether there is any point in ‘planning’ for children, as the results often run counter to children's play needs (see Chapter 5).

Roe's [2006] study of 6- to 10-year-old children’s relationship with their local environment in a rural village in the north east of England highlights the significance of special areas for children’s experiences. Roe notes that the need for children to find a place that was secret from adults, where they could simply ‘hang-out’, supports previous research by Korpela and others (2002). The absence of adult knowledge and intervention in the space was highly prized by the children. Roe (2006: 175) also comments that the special places:

contained a number of attributes highly valued by children, and understood by parents, i.e. potential for danger, climbing, small spaces, potential for observation, out of bounds from parents, unmanaged by adults and ‘untidy’ or wild. In this study these places appeared often on the boundaries in ‘in-between’ spaces such as within hedgerows, or were in areas difficult to get to such as steep slopes or across the stream.

Learning care

The third theme associated with Derr’s analysis of children’s place-making relates to the caring connections that children establish with the environment, both through relationships with adults and directly with a sense of ownership and affiliation with their local spaces. Again, this theme would find support from other studies. Bixler and others (2002), in their study of children’s play in wild areas, found that respondents who reported having played in wild environments had more positive perceptions of natural environments, outdoor recreation activities, and future indoor or outdoor occupational environments. Similarly Wells and Leckies’ research (2006) concludes that childhood participation in activities in wild areas, along with ‘caring’ for nearby nature, have a positive relationship to adult environmental attitudes. Lohr (2007) suggests that childhood interactions with nature appear to correlate with a positive regard for the environment in later life. In general, this response is stronger if the interaction with nature in childhood is active rather than a passive appreciation of natural environments.

Thompson and others’ (2008) research notes that childhood experience of playing out in natural space is a predictor of adult activity patterns of access to woodlands and green spaces. While this is a complex pattern, in general they assert that children’s lack of green space experience may inhibit their motivation to visit green spaces as an adult. The research concludes that:

People who often visited green places as children are more likely to associate natural areas with feeling energetic and more likely to visit green or wooded areas within walking distance of home, both of which suggest that habits of healthy outdoor exercise as adults are linked to patterns of use established in childhood. People who were frequent visitors as children are also more comfortable visiting woodlands and green places alone as adults and more likely to think green spaces can be magical places. It appears that such people have not just a physical relationship with green outdoor places but also an emotional one that influences how people feel about themselves and makes them more open to positive and elemental experiences in these places.

The research suggests that, given this possible connection between childhood activity in natural spaces and later adult access, it should be a matter of concern that current restrictions on children’s access to natural spaces may be imposing limits to their future outdoor exercise as adults.

Cultural web

The final strand of Derr’s analysis of children’s relationship to place examines the cultural ‘web’ of experiences that children encounter in their daily interactions, the narratives and histories of others that add significance and meaning to place. As Derr (2006: 118) points out, ‘the web
consists of more than stories, it embodies an entire social relationship with extended family and community.

Cornell and Hill (2006) comment that perhaps traditional narratives of witches, dragons and other mythical creatures associated with the outdoors have now been replaced by more scary stories of ‘strangers’. The sense of fear that the modern outdoors generates may impact on children’s freedom to establish strong connections and expand their social networks from the immediate family to peers and non-familial adults. Such restrictions may decrease children’s sense of autonomy and their ability to develop solid, trusting relations with others (Spilsbury 2005).

Bixler and others (2002) highlight the significant influence of family and social relationships in developing and fostering positive or negative attitudes to the environment. Drawing on a number of research studies, they note there are many ways in which the values of parents or peers influence children’s opportunity to play in natural space, for example, such as having parents with the interest and resources to buy a house near green space or a ‘natural’ park. They also suggest that even if there is no direct interest in the outdoors within the immediate family, a neighbourhood friendship may result in accessing and exploring natural spaces. Equally, the influence of the peer group may be significant in determining the value of such spaces.

Not only are the values of the parent or peers important in access to wild play areas, the interpretation of the child’s experiences by parents and peers may also be a factor in how children interpret their adventures in natural areas.

(Bixler and others 2002:797)

Equally, as discussed in the section on children’s identity and subjectivity, children’s access to their local spaces will also be a feature of the wider social and cultural processes that impact on individual, family and the wider context. Thompson and others’ (2008) review of the research suggests that there are gendered, class and ethnic forces which may restrict access. For example, they cite research findings from the UK and the US that minority ethnic groups’ access to outdoor and natural environments is influenced by fear of racial attack and bullying.

Summary
The research presented in this section suggests that attachment and friendship involve an inextricable link between the social and the spatial. As Orr (1994: 147) comments:

Knowledge of a place – where you are and where you come from – is intertwined with knowledge of who you are. Landscapes, in other words, shape mindscapes.

‘... there may be some tension between what adults find desirable in outdoor public spaces, and children's needs.’
Children's places are not simply a physical space of size and landmarks, but places where they carry out everyday environmental transactions (Matthews and Tucker 2006); they are multi-layered and multi-faceted, what Hart (1979) in his ethnographic study of children's relationship to place refers to as ‘phenomenal landscapes’. Children will seek to change and adapt their spaces to suit and accommodate their play needs and desires (Derr 2006). This will involve moving between the variety of spaces that the neighbourhood affords for play, developing strategies for finding one's way through the environment and developing coping mechanisms to respond to the novelty and uncertainty encountered. Similarly, at times of stress children will seek out their places of refuge and safety, often in natural sites, as indicated by the work of Korpela and others (2002). Yet this deliberate element is also subject to the wider pressures and influences at work within local places; children's relationship to place is related to the socio-political context of their lives. If children see spaces as ‘no go areas’, and there are clear public messages about the acceptable forms of behaviour in such spaces, then there will be an associated impact on children's emotional attachment to these places (Manzo 2003). This will be developed in Chapter Four with a further consideration of children's play patterns and contemporary issues that impact on children's transactional relationships with their immediate environments.

Factors that impinge upon playing

This chapter has, up to this point, considered the benefits of playing in terms of its capacity to promote systems that enable resilience. However, it cannot always be guaranteed that playing will produce the benefits we have so far seen from the evidence, since playing is one element in a range of factors that influence children's health, development and well-being (Sutton-Smith 2003). Indeed, Burghardt (2005) identifies forms of playing that may be considered to have a high, even unacceptable, cost attached (either to the player or, in the case of cruel play, to their victims), and that may be addictive or harmful. Yet there is also evidence that an inability to play will have a deleterious effect particularly on social and emotional health and development (for example, Panksepp 2007).

This section explores some of the literature on factors both within the child (endogenous) and external to the child (exogenous) which compromise (put at risk) the development of adaptive systems and resilience through playing. Once again, it should be stressed that internal and external factors are not separate but interrelated. This is not an exhaustive review, and medically diagnosed conditions such as Attention Deficit Hyperactivity Disorder (ADHD) and autism are included as illustrations only, showing how endogenous and exogenous factors can combine to have an influence on ability to play and therefore to realise any benefits for the development of adaptive systems that may accrue.

As previously noted in the introduction to the literature on resilience, Masten (2001) comments that this 'ordinary magic' is a commonplace strength of children that arises from a number of adaptive systems available to them during the period of childhood. Play operates across these adaptive systems, at different levels, to build and enhance resilience factors through developing flexible and responsive emotion regulation systems, promoting pleasure and enjoyment and a sense that life is worth living, enhancing stress response systems, developing creativity, and supporting strong attachment systems. Masten (2001) suggests that, where these systems are in good working order, development will be 'robust', even in the face of adversity and threat. However, if these systems are impaired then the likelihood of development problems is significantly increased, especially where the environmental hazards are profound and prolonged.

Throughout the review of play's relationship to this range of adaptive systems, evidence of the potential consequences of threats and compromises to these systems has also been noted. 'Threats' may operate in highly complex ways to destabilise these adaptive systems. This process of destabilisation, as Rutter (2006) indicates, operates in different ways in to each child and each situation, from its impact on the genes, on the cells in the body, and on brain development, right through to the impact of the wider physical and sociocultural environments that children inhabit.
The brain, as well as being enormously plastic, is also a self-organising system (Lewis 2005). That is, the relationship between brain, body and environmental experience helps shape the architecture of the brain. This shaping process establishes the ways in which the brain may respond to future experiences. Play, being flexible and open to novelty, supports the organisation of a highly responsive and finely tuned integration between the limbic and cortical regions, which, as Lewis (2005) suggests, acts as a powerful antidote to developing habitual patterns of appraisal and behaviour. This plasticity of the paralimbic system is the key to resilience.

However, where experiences are limited and threatening, the brain may develop adaptive neural connections that are likely to constrain flexibility and openness in both emotional and behavioural responses to situations (which suggests that adaptive systems may also be maladaptive). Children are ‘responsive to environmental perturbations and adjust their behaviours in response to these changes’ (Pellegrini and others 2007: 270). Thus, for example, Schore (2001) suggests that prolonged emotional stress in infancy may deactivate areas of the brain that are responsible for processing social information, and this ‘loss of freedom’ will impact on emotion regulation and response to novelty. As Lewis (2005) explains, this pattern of self-organisation may be the key to vulnerability to psychopathology.

Given that the brain organises itself in response to the pattern, nature and intensity of experiences, it is fairly evident that there are times when negative or depriving experiences are likely to have a serious and sustained impact on the development of the brain (Reid and Belsky 2002). Shore (2003) notes that trauma, neglect (emotional and physical), social deprivation and a chronic lack of appropriate stimulation are among the many factors identified as having a significant impact on development.

Children live within social, cultural and physical landscapes which are mutually connected and interactive. This environment has an effect on the playing child just as the child’s biological systems inform their transactions with this environment: they mutually shape each other. Gendered, racial and class features intersect to create physical and sociocultural environments that at times may be oppressive and hostile. Children who have developed a playful, innovative response to their environments, with associated internal mechanisms of emotion regulation, strong attachment and social support mechanisms, and effective stress response systems, may adapt to these in flexible ways, displaying resilience.

‘Children who have developed a playful innovative response to their environments ... may adapt to these in flexible ways, displaying resilience.’
However, this is a highly complex process and subject to multiple influences, as the literature on class differences in play discussed earlier showed. Children from both Reay and Lucey’s (2000) and Sutton and other’s (2007) studies demonstrated that their peer friendships, ‘hanging out’ and outdoor play behaviours represent a way for them to move beyond the security offered by staying in (and the avoidance of those who are seen as ‘other’) and afford the opportunity to know and be known by others in their neighbourhoods, building a sense of belonging and attachment. Yet this informal association may not currently be recognised or valued in key policy initiatives. In fact, as Sutton and others (2007) highlight, the interventions and guidance of young people into ‘constructive activity’ might penalise those very children and young people who might benefit from having a visible presence in public places. Play, for these children, takes the form of the things that help children to survive and thrive – a mixture of avoidance, connections, distaste and belonging (as experienced through the primary emotions) – and for the children living in these areas this represents a more coherent form of engagement than the middle class virtues that are often espoused through the social capital discourse as discussed in the next section of this chapter (Sutton and others 2007). Reay and Lucey (2000) also point out that attention needs to be given to working-class understandings of locality and place within the studies and research into children’s connections with their local environments to ‘counter the hegemony of middle-class versions … otherwise we will never be able to move very far from representations of deficit and pathology in relation to the urban poor’ (Reay and Lucey 2000: 425).

Equally, Levinson’s (2005) ethnographic study of Gypsy children’s play in the UK raises some interesting and complex questions about the nature of play and cultural identity. Levinson’s detailed longitudinal study highlights how play for Gypsy children may operate to maintain a separate identity and enforce boundaries. Yet this overtly aggressive and often destructive behaviour is perceived by many ‘outsiders’ as a barrier to participation in educational and social institutions. Children’s play patterns are seen to differ from the ‘norm’ as Gypsy children attempt to ‘fill a vacuum created by the erosion of traditional identity markers’ (Levinson 2005: 500).

Stereotypies
Burghardt’s (2005) study of animal play distinguishes between the characteristics of play behaviour and stereotypies, described as a repetitive aspect of behaviour that may have some similarity to play. Burghardt suggests that such behaviour develops during the animal’s life and may be induced by poor or inadequate conditions. The development of stereotypies is generally considered to be pathological and harmful; it demonstrates inflexibility in response and narrowing of behaviour patterns. Yet as Burghardt claims, these behaviours may also provide adaptive benefits to psychological well-being. Thus, the times when boys ‘do’ being boys in their peer relationships may be a form of adaptive behaviour to the specific niche at that time, yet to an outsider it would appear to be oppressive or stereotypical behaviour.

As the research highlights, adopting and performing stereotypical roles may be one part of the nature of playful relationships between peers. Such positions may involve dispute and contest which, as Goodwin (2006) suggests, is a vital part of children’s development of peer friendships and a primary way in which activity is constructed. This process also allows for the possibility of transforming these relationships and developing new ways of being (Guss 2005).

However, stereotypies may ‘occur more frequently when the animal or person is under some stress or conflict’ (Burghardt 2005: 63), and again is generally associated with poor or degraded environmental quality. Where this stress is prolonged, the behaviours are likely to become more stereotypical, limited and limiting. Nevertheless, as Burghardt comments, preventing the animal from performing the stereotypic act may actually cause further harm without removing the cause of the stress.

Given the complex environments that children inhabit, the relationship between brain, body and environment is likely to result in highly idiosyncratic features of organisation across these systems which reflect the nature of contemporary sociocultural environments. In the following sections, the literature on compromises to adaptive systems is explored, particularly studies on Attention Deficit Hyperactivity Disorder (ADHD), autism and play deprivation.
Attention Deficit Hyperactivity Disorder (ADHD)

The condition of ADHD is a disorder originating in childhood, normally characterised by overactive behaviour, impulse control, concentration and difficulty in paying attention (Brassett-Harknett and Butler 2007). Despite considerable research, there is longstanding controversy regarding the nature and validity of this condition (Stefanotos and Baron 2007). For example, a study by Banerjee and others (2007) suggests that, while a substantial fraction of the causes of ADHD may be due to genes, there are many environmental risks and potential gene–environment interactions that operate to increase the risk for this disorder. Banerjee and others highlight a range of potential risks including food additives, diet and lead contamination.

Although substantial evidence has accumulated to support the diagnostic validity of ADHD, some argue that ADHD symptoms may simply describe the exuberant behaviour of normal children. Others accept that some children with ADHD have a neurological disorder; but contend that weaknesses in the current diagnostic criteria cause some children to be diagnosed inappropriately (Markovitch 2004; Willcutt and Carlson 2005). Bassett-Harknett and Butler's (2007: 190) literature review into the causes and outcomes of ADHD notes:

AD/HD can manifest itself in a variety of different ways and has a variety of causes, making it a very complex condition to understand. It is believed by some that AD/HD is located at the extreme end of a continuum with symptoms of inattention, hyperactivity and impulsivity being distributed continuously in the general population … What marks AD/HD apart is that the levels of activity, distractibility and impulsivity are considered developmentally inappropriate, cause impairment to normal functioning, and are evident in multiple settings, including home, school and in social relationships.

Rose (2005) notes that children diagnosed with ADHD are defined in relation to others, that is, in relation to what is expected from normal children by adults. Yet the cause of this aberrant behaviour is now unequivocally located inside the child's brain:

This has led critics to describe ADHD not as a disorder but as a cultural construct, in a society that seeks to relocate problems from the social to the individual. (Rose 2005: 256)

Rose continues with a critique of many of the scientific claims made for a genetic origin of ADHD, noting that the child's behaviour is seen as an individual, medical problem, a deficit within the child, requiring a medical response. Timimi (2006) also suggests that the narrow medicalisation of ADHD may serve to obscure the diverse social, environmental and political causes of mental distress. Davis (2006) notes that the voices of children are rarely heard in the ADHD debate, and while recognising the biological influences, the study of this disorder needs to move from a medical model to one that locates ADHD within a disability perspective and considers the range of cultural and social influences that impact on children.

Prout (2005) seeks to resolve the social/biological binary: the ability to pay attention, maintain focus, sit still and so on will vary because of individual differences in brain functioning; these differences have no meaning in themselves but acquire meaning in the socio–cultural context. In other words, according to Prout, ADHD arises from a combination of biological difference and the needs of a mass schooling system which requires children to sit still, concentrate on tasks and achieve results. This system also measures the comparative success of students through continuous testing; those that are not up to the mark are seen as problematic. This is not an objective measurement, but is highly subjective based on the experiences of teachers, parents and other adults.

Parents who feel their child is failing … seek remedies, often trying a number of different approaches before accepting the ADHD diagnosis. Other children, too, may find inattentive and impulsive behaviour disruptive of their schooling and children perceived as failing and/or problematic may come to experience themselves in these terms and want to find a solution. These different interests are drawn together, and allied to those of medical scientists, researchers, and pharmaceutical companies by groups such as Children and Adults with ADHD. (Prout 2005:139)
Given the increased pressure on education systems to deliver narrowly defined standards, and the accompanying rhetoric of the responsibility of parents for their children, it is understandable that all feel a sense of relief to know that the child has a medical condition; the label provides a legitimate justification to ‘outsource’ some of the responsibility for raising children (Cohen 2006). In looking at the arguments presented for the nature of ADHD we may see that both the genetic and the environmental proponents both downplay the societal and relational issues. Timimi (2006) comments that the gender gap in the distribution of ADHD (with a significantly higher proportion of boys diagnosed with the disorder) may be a reflection of the increasing feminisation of the space of childhood. While young males form the majority of those labelled, it is overwhelmingly adult females who make the first assessment that a child’s behaviour is outside the ‘normal’ range. Singh (2002) also notes research that explores ADHD diagnosis as the medicalisation of ‘normal’ boys who are failing to achieve in a competitive social and educational environment. Citing the work of Hart and others (2006), Timimi (2006: 40) suggests that an ecological and cultural perspective on the nature of ADHD may be a barometer of social anxiety about children’s (particularly sons’) development, with stimulants being used as a tool for rearing and educating boys.

In many cases, diagnosis of ADHD will lead to medical treatment. Prout (2005) acknowledges that children in the US and Great Britain grow up in societies where drug use is accepted and pervasive. Given that ADHD is seen as a medical problem, then the expectation is that there is a medical treatment for this condition. The treatment developed has centred on a drug which enhances dopamine transmission – methylphenidate (best known by the trade name ‘Ritalin’). The effect of this drug is similar to amphetamine, which has been widely used as a stimulant. It is proposed that by enhancing dopamine transmission, the connections between the limbic and prefrontal regions are improved, enabling the ‘rational’ brain to mediate the more emotional and impulsive areas, thus reducing the excesses of inattentive and impulsive behaviours. Rose (2005) comments that there is little scientific evidence to support these claims, and yet the drug does appear to work: medical treatment may indeed make a difficult life more comfortable for parents, teachers and for children themselves. Cohen (2006), looking at the figures for prescription of stimulants in England notes that there were 6,000 prescriptions in 1994. This figure rose to 186,200 in 2,000, and by 2004 there were 458,000 prescriptions, a 7,600 per cent increase in a decade. Yet this figure is still five times lower per head of population than the US, which issued about 13 million prescriptions in 2003.

Cowgill and Marcovitch (2004) provide a useful summary of the key arguments for and against the administration of drugs. Marcovitch concludes the review with an acknowledgement that, while evidence suggests that prescriptions are safe in short term use, there is a lack of evidence that the right children are being treated.

In looking at the benefits of medical treatment of ADHD, Panksepp (1998; 2007) notes that short-term improvements in behaviour certainly occur. However, when treatment is withdrawn, there is every chance that the symptoms will reappear, which suggests that children are not learning to manage their lives any better. The administration of psycho-stimulants may have some harmful effects for children, along with an expression from some children that they do not like the feelings induced by these drugs, as this extract from Rose (2005: 259) indicates:

Sometimes I like it but sometimes I don’t … If I do take it when we didn’t have school, I wouldn’t want to go outside and play with my friends, or I would just want to stay in home by myself and read a book or watch television or something.

Panksepp (1998; 2007) also suggests that administration of psycho-stimulants may have a harmful impact on neural plasticity. A significant amount of brain plasticity is supported through the production of the neurotransmitter glutamate; in general the administration of psycho-stimulant may inhibit glutamate mediated neural transmission and decrease neural plasticity. While the research into the long-term effects of administering Ritalin and the newer medication Strattera, is unclear; it is important that ‘we should always be entertaining environmental alternatives to deal with cultural problems’ (Panksepp 1998: 95). Equally, Rose (2005) maintains that Ritalin does
not ‘cure’ ADHD. The masking of the behaviours displayed may give some temporary and much needed respite for parents, the child and teachers, but this needs to be accompanied by attempts to resolve relational issues, to adjust society rather than simply numb the mind.

Armstrong [2006] suggests that a strong social undercurrent in relation to ADHD is the gradual decline in opportunities for free unstructured play for a variety of interconnected factors (discussed in more detail in Chapter Four). Panksepp (2002; 2007) notes that many of the symptoms associated with ADHD actually reflect playfulness and the medicines may be effective in that they reduce a child’s playfulness and enable the child to adapt to a classroom environment:

This idea also forces us to consider what types of beneficial effects for brain development might be advanced by allowing abundant natural play during childhood, and whether administration of play-reducing psychostimulants might reduce such benefits. (Panksepp 2002: 236)

Panksepp (2001) explains that the maturation of the cortical regions promotes and channels a child’s ability to reflect on their situation, to plan for future actions, to share emotions with others and to ‘confront the world with a creative and playful attitude’ (Panksepp 2001: 157). This maturation is supported through the child’s experiences within his or her environment (experience-dependent plasticity) which strengthen synaptic connections between the limbic and prefrontal cortex. Play, as discussed earlier in this chapter, may be the primary process for enhancing this connectivity. Panksepp asserts that there has been a neglect of some of the most simple and straightforward strategies for responding to the increase in the diagnosis of ADHD, and proposes that simply supporting children’s rough and tumble forms of play may lead to the healthy maturation of children’s brains. This would find support from many of the animal studies into rough and tumble play and the development of the ‘social brain’, for example, Pellis and Pellis (2007).

Alongside this, there may be other features within an environment that may strengthen connections between emotional-appraisal systems, as discussed in the section that looks at children’s playful relationship to the outdoors, in particular access to natural space (Taylor and Kuo 2006) and access to modest environmental stressors (Yun and others 2005). Kuo and Taylor (2004) present research with children aged 7-12 years in the US which suggests that children identified with ADHD showed signs of reduced symptoms after participating in green space leisure activity.

Results indicate that symptoms were better than usual after activities in relatively green settings. Moreover, the after effects of activities taking place in green outdoor settings were better than those of activities taking place either indoors or in relatively built outdoor settings, and the greener a child’s typical play settings, the less severe his or her general symptoms. (Kuo and Taylor 2004:1581)

Following these initial studies, Kuo and Taylor undertook research with a broader sample across different regions and socio-economic conditions, which largely concurred with their initial research studies, concluding that access to natural settings for after-school and weekend activity may be widely effective in reducing the symptoms of ADHD. They argue that children’s regular access to green space would enhance treatment for children currently receiving medication, allowing for a reduction in dosage and better self-management of attention. For those children not receiving medication, ‘green time outdoors might offer the only relief for symptoms available’ (Kuo and Taylor 2004: 1585). The research has attracted some critical commentary, for example, Canu and Gordon (2005) question the study design and the largely unproven conclusions drawn from a statistical analysis based on parent report. However, in response, Kuo and Taylor (2005) highlight the fact that while drawing on heterogeneous sources, the findings hold across a wide variety of activities, environments and children. They suggest that this raises exciting possibilities which are certainly worthy of continuing research.

Kaplan and Kaplan (2005) explore the concept of mental fatigue, arising from the overworked capacity of direct attention. Direct attention necessitates effort to get through a boring or difficult task and because it takes effort, it is susceptible to fatigue. The results of this
fatigue may be evidenced through being readily distracted, having difficulty in planning, and an inclination to be impulsive and irritable.

An alternative form of attention may be found in ‘fascination’ – attention that is effortless, arises from excitement and interest and is less susceptible to tiredness. Kaplan and Kaplan’s (2005: 277) attention restoration theory proposes that ‘time spent in effortless pursuits and contexts is an important factor in the recovery of mental fatigue’. The review of research into the nature of fascination leads Kaplan and Kaplan to suggest that the natural environment has a strong restorative effect for many people.

**Autism**

Autism is considered to be the most severe of the childhood neuropsychiatric conditions. It is diagnosed on the basis of abnormal development of social behaviour, communication and imagination, often in the presence of marked obsessional, repetitive or ritualistic behaviour (Baron-Cohen 2003). Rose (2005) comments that whatever its genetic origins, autism is essentially a developmental defect which impacts on a child’s ability to communicate, leading to a failure in attachment and bonding in the early years. Children and adults with autism have difficulties with everyday social interaction. Their ability to develop friendships is generally limited, as is their capacity to understand other people’s emotional expression.

Recent research (Dapretto and others 2006) indicates that a dysfunctional mirror neuron system may underlie the social deficits observed in autism. Children with autism spectrum disorders (ASD), when given a face recognition task, may not engage a mirroring mechanism and thus must adopt an alternative strategy of increased visual and motor attention but without experiencing the emotional significance of the facial expression. Panksepp (2001) notes that some forms of early childhood autism may be due to brain abnormalities in systems that mediate emotions related to social attachments. One possible explanation may be found with the overproduction of brain-derived opioids – known to inhibit social motivation and causing social isolation and aloofness:

> Developmental changes in endogenous opioids may regulate feelings of social interest and independence. Because social aloofness is a common characteristic of autism, sustained overactivity of such brain systems could chronically change social motivation. (Panksepp 2001: 153)

However, as Panksepp (1997) observes, there is a general acceptance that autism is a multi-factorial disorder which is not the product of a single gene, brain chemical system or environmental insult, but is likely to be the result of many biological and environmental influences working in combination.

Rose (2005) provides a critical comment on the increasing diagnosis of autism, questioning whether it has become more common, better recognised or a ‘currently fashionable label as part of the medicalisation of the human condition’ (Rose 2005: 136). He observes that throughout history all cultures have recognised the existence of mental anguish and associated conditions of anxiety or distress, yet these forms of behaviour were accepted as being part of the diversity and ‘rich tapestry’ of the human condition. It is only in recent times that such behaviours are being classified as ‘diseases’.

**Autism and play**

Libby and others (1998) comment that much controversy surrounds an understanding of the ability of children with autism to engage in spontaneous play. Traditional approaches have suggested that children with autism tend to produce highly rigid stereotypical behaviour towards toys and objects and do not engage in symbolic play. Libby and others (1998) question this stance, and their research with autistic children indicates that symbolic play skills were not totally absent.

Sherratt (2002) comments that children with autism may display a range of rigid and idiosyncratic play behaviours that indicate a delay or impairment in symbolic play, creativity and imagination. Sherratt’s intervention study with children, in which a number of deliberate prompts were issued to support and guide symbolic play, notes the success of the intervention...
strategies in enabling children with autism to increase the amount and content of symbolic play episodes. Perhaps the most significant finding is that, not only did children demonstrate these new play ‘skills’ under guided conditions, but they ‘ultimately used symbolic play spontaneously in unstructured settings’ (Sherratt 2002: 177). Similarly, Field and others (2001) highlight the importance of early adult interventions to support the development of play in children with autism, particularly through adult imitation of children’s behaviours.

Jarrold (2003) questions the reliability of some of the studies exploring the nature of pretend play in children with autism and notes that some individuals do appear to engage in pretend play, which suggests that children with autism may have an ‘underlying capacity to pretend, but, for whatever reason, they fail to show this spontaneously’ (Jarrold 2003: 382). In his review of the research, Jarrold concludes that judging whether a child is truly pretending is extremely difficult; we use actions to infer underlying intentions without any guarantee that one relates in any way to the other. In looking at the pretend play of children with autism, Jarrold acknowledges that, while it is apparent that children may have problems in pretend play, what is less clear is whether these problems reflect a basic inability to pretend or some other difficulty which affects the ease with which pretend play can be initiated. Drawing on research findings, Jarrold notes that children with autism may well understand the nature of pretend play, but the inability to produce pretend play forms may arise from the process of carrying out an act of pretence. This may suggest that children with autism can pretend, but ‘tend not to do so because of some internal reluctance or lack of incentive to do so’ (Jarrold 2003: 386). It may be that the preference for literal interpretations in their play and difficulties caused by having to make multiple interpretations in pretend play means that pretend play does not bring the same rewards as it does for the ‘typical’ child.

In their review of the literature on teaching children with autism spectrum disorders to play using behavioural techniques, Luckett and others (2007) question both the understanding of play used in the studies and also the motivation or purpose in teaching children to play in this way. They suggest that using external rewards and behavioural approaches in order to teach children to engage in symbolic play has raised concern that the children may not be playing in any genuine sense of the word. They note that the literature identifies two key reasons for encouraging playing in children with autism: firstly, the development potential and secondly the diversionary potential – diversion from other behaviours seen as unacceptable. Often, in behavioural studies, what was understood as ‘inappropriate’ play was replaced with ‘appropriate’ play through behavioural techniques. The authors cite Donnelly and Bovee (2003) who suggest that what in fact may have taken place was a replacement of play according to characteristics of choice, spontaneity, control and positive affect, with imitative behaviours that appear more socially acceptable:

There seems little doubt that people with autism often differ from the mainstream with regard to the activities that they find engaging, motivating, and enjoyable; their preferences demand consideration and respect. (Luckett and others 2007: 375)

Generally, while changes could be seen in play behaviour, many of which could be generalised to situations beyond the training, there was little consistency in measuring the disposition towards the behaviour, and so the characteristics of playing could not be generalised from the studies reviewed.

The extensive research literature on the nature of play in children diagnosed with ASD largely considers the different interventions to increase or facilitate peer interactions in children’s free play. Such studies tend to concentrate on the effectiveness of structured training initiatives and associated cognitive and social benefits from these interventions. There appear to be very few studies that consider the environmental influence on children’s play patterns. However, recent work by Yuill and others (2007) does consider the ways in which children with ASD responded to a change in their outdoor playground. Working with an ASD unit for twelve 5- to 11-year-old children in West Sussex, the study explores how the introduction of a new playground influenced the level of social interaction and play behaviours of the children over time. Key features in the design were:
the introduction of climbing walls, towers and slides that presented a challenge for children, in contrast to the old playground in which the equipment was well within all children’s capabilities

- props for imaginative play that tended to remain constant in contrast to providing different toys and props on a daily basis in the old playground and thus not providing the opportunity to develop play routines

- the possibility of connecting pieces of equipment in flexible ways and through a circuit design so that movement over one piece of equipment would lead to the start of another, compared with a linear layout in the old playground

- observation points to enable children to have periods free from the need to interact with peers. The design features a lookout tower for a child to stand and observe play and other equipment.

Observations of children’s use of this new space clearly indicated that group play was higher than in the old playground:

Qualitative observation suggests that the layout of the playground was important in providing sufficient structure to guide children’s activities together with an appropriate level of challenge and props to foster group and imaginative play.

(Yuill and others 2007: 1195)

The research describes how children used the physical challenge presented in the environment to make comparisons of success over time, while the consistency of props enabled children to develop opportunities for imaginative play patterns to emerge, and the circuit structure of the playground components helped children to structure their play.

While this may inevitably be a feature of a novel environment, teacher observations report that the patterns established at the start of using the new space have continued over time. This study raises the potential value of considering the environmental features of outdoor play space for children with ASD and their affordance for play. In light of Luckett and others’ (2007) review, such environmental interventions may hold a greater potential for children to develop their own play and peer interactions than structured intervention.

Play deprivation studies

If play is beneficial, then it would follow that depriving children of the opportunity to play would have harmful effects on their development and well-being (Bateson 2005). Siviy and others (2003) note that play behaviours are common across most mammalian species and in humans. The presence or absence of play may be useful as a diagnostic indicator of a child’s overall state of well-being: ‘Since playfulness is commonly thought to be an adaptive behaviour that is also associated with healthy development, the relative lack of play in an otherwise playful species could be indicative of some underlying pathology’ (Siviy and others 2003: 293).

Hughes (2006: 79) provides a detailed discussion of the possible consequences of play deprivation, citing damage to children’s ‘identity, their social reference points, their neurological development, their search for homeostasis and even their potential to evolve’.

The factors that contribute to stress for children are highly complex, and research studies with children often do not allow the inference of causality that is evident in animal research because of the presence of so many uncontrolled and confounding variables (Hubbs-Tait 2006) in the human environment in contrast with the laboratory cage of a rat. Equally, isolation experiments with animals deprive the young not only of play but of other forms of contact and sensory stimulation from peers (Spinka and others 2001). However, the diverse range of animal studies that have explored the relationship between stress, environmental enrichment and play may allow the possibility of seeking general principles of operation and highlight neurological aspects of human brain/mind function which could not ethically or practically be approached with comparable rigour in the study of humans (Panksepp 2007).

Burghardt (2005) acknowledges there is little solid empirical evidence that play deprivation, as a single factor, has long lasting consequences for development. Indeed, it is very difficult
to isolate play as a single feature of deprivation. Viera and others’ (2005) study with hamsters suggests that, when the animals are deprived of play for short periods of time, there is a greater motivation for play following isolation, demonstrated through a ‘play rebound’. Similar studies with rats (Holloway and Suter 2003) would confirm the existence of this phenomenon. Panksepp (2001) suggests that this ‘play rebound’ following a short period of play deprivation provides evidence of the importance of this form of behaviour for healthy brain and psychological maturation. Viera and others (2005) and Holloway and Suter (2003), along with numerous other studies, also show that prolonged play deprivation has a more profound and long lasting impact on behaviour.

Severe environmental stress has a deleterious impact on brain development (McEwen 2007). As Burghardt (2005) suggests, play takes place in a ‘relaxed field’ (that is, when there are no stresses or other constraints in the environment), and the lack of this relaxed field is likely to affect the potential for play to occur. Pellegrini and others (2007) also comment that play occurs in safe and familiar environments for children, and that where organisms are under stress, levels of play may be reduced or terminate completely. If, as Sutton-Smith (1997) asserts, play is central to maintaining plasticity, then the deprivation of play experiences is likely to have an impact on brain development and the loss of flexibility and integration across brain regions.

Animal based research has provided rich experimental data concerning the positive impact of environmental enrichment (for example, the provision of play materials) and the correspondingly negative impact of environmental deprivation on brain and behaviour. Research by Pellis and Pellis (2007) suggests that rats deprived of play are overly stressed by novel social encounters and are poor at developing strategies that can overcome these stressful situations. A key feature of play deprivation for rats appears to be damage to the orbito-frontal cortex, a key region of the brain involved in the mediation of emotions. Damasio (2003) highlights the fact that damage to this area has devastating consequences which result in inappropriate reactions to social situations and a ‘skewed’ concept of the social world (Roberts and others 2004).

Cui and others’ (2006) research with rats notes that social and environmental stress in early life causes changes to the transmission of neurochemicals and/or cognitive defects which, in turn, may also increase susceptibility to depression in adult life. Arnold and Siviy (2002) explain that, although play is a relatively robust behaviour pattern, it can be disrupted by the presence of stressors or threats to the organism, citing research studies with animals which highlight the impact of fear, food deprivation and novelty on play behaviour. As well as the effects associated with these environmental stressors, early stress interventions have an influence on playfulness at a later stage in development.

Spinka and others (2001: 155) conclude that, on the whole, findings from animal research indicate that ‘play deprivation results in increased fear and uncertainty in novel environments, and more escalated aggressive behaviour towards other animals in serious conflicts’.

**Extreme deprivation**

The question of the impact of early physical and social deprivation on human psychological development is obviously of great interest. However there are clear ethical and practical problems in being able to carry out detailed scientific research in this field. The severe and unusual set of circumstances generated by the fall of the Ceausescu regime in Romania at the end of the 1980s has provided an opportunity to examine the effects of extreme deprivation on a relatively large group of children.

Chugani and others’ (2001) follow-up research with children from the Romanian orphanages adopted by families in the US comments on the rapid ‘catch-up’ made by children in their new homes but raises some issues about the impact of the early years stress on brain development. The study found that early and profound stress had affected the development of specific brain areas, in particular the limbic system, which has a significant role in emotions and behaviour; and that:

... chronic stress endured in the Romanian orphanages during infancy in these children resulted in altered development of these limbic structures and that altered functional
connections in these circuits may represent the mechanism underlying persistent
behavioural disturbances to the Romanian orphans. [Chugani and others 2001: 300]

Beckett and others (2006) report on the longitudinal study implemented with a number of
Romanian children who were adopted by families in the UK. The studies use general cognitive
testing methods, and previous studies have reported on the progress of these children at
various ages through their childhood (Rutter and the English and Romanian Adoptee Study
[ERA] 1998; Rutter, O’Connor and ERA 2004). Of particular interest is Kreppner and others’
(1999) ERA study, which explores the impact of extreme and early deprivation on children’s
social play (in children aged 4 years). Using a control group of UK adoptees and two Romanian
groups (early and later adoptees), their study indicates a general tendency for the UK group to
engage in higher frequencies of pretend play and role-play, inferring different mental abilities
from the Romanian groups. They suggest that deprivation has a striking impact on pretend and
social role-play and that this may have serious implications for social relationships with other
children. As Russ (2004) proposes, pretend play has a key role in children’s emotion regulation
and interpersonal processes and thus deprivation may have serious implications for young
children’s social and emotional development.

Beckett and others’ (2006) study revisited the group at the age of 11 years and found that
the effects of early institutional deprivation persisted despite the children having spent at
least seven and a half years in their adoptive homes (although for the children identified with
the lowest cognitive scores at the age of six there was some considerable improvement). The
detailed research report considers some of the possible explanations of the impact of early
deprivation, signposting the emerging field of gene-environment studies to suggest that part
of the explanation for the diversity of results from the study may be attributable to genetically
influenced variations in susceptibility to environmental hazards. In relation to the research’s
application to a wider examination of child development, the report concludes that any outcome
of deprivation may vary according to the nature and timing of adverse experiences, and to the
qualities of the environment to which children move when leaving the harmful situations.

Webb and Brown (2003) describe how playwork interventions with a group of children in a Romanian
orphanage in Sighisoara promoted considerable recovery from many years of neglect and abuse:

The findings suggest, above all else, that the Therapeutic Playwork project helped
these children to become social beings, not isolated units. Every child began to form
reciprocal relationships, which in turn led to a greater sense of self-worth.
(Webb and Brown 2003: 175)

While specific research into the nature of play deprivation in humans is limited, there is a
general acceptance that severe and prolonged stress will have a significant harmful impact on
basic adaptive systems. The brain is pivotal in the response to stress as it determines what is
threatening and potentially stressful, and what action to take in response to this.

Hughes (2006) notes that play deprivation, in its extreme form, leads to a detachment of
the most fundamental sensory and emotional connections with the environment, citing
Ogdens’s (2001) phrase, ‘psychic disintegration’, to describe the destructive cycle initiated by
this impoverishment of experiences. Equally, Sturrock (2003) states that, where there is a
disruption to play and the ludic ecology, there will inevitably be disturbances of the self.

McEwen (2007) comments that stress and the neurochemical response to it will produce both
adaptive and maladaptive effects on the structure and shaping of the brain. Prolonged and
severe stress will remodel key areas of the brain, which in turn will shape future behavioural
and physiological responses. McEwen (2007: 873) also suggests that ‘social and behavioural
interventions such as regular physical activity and social support reduce the chronic stress
burden and benefit brain and body health and resilience’.

Animal research has produced evidence of the importance of ‘complex’ or ‘enriched
environments’ in supporting healthy brain growth. For example, Benaroya-Milshtein and others’
(2004) research concluded that mice reared in an enriched environment displayed decreased anxiety-like behaviour and higher activity compared to standard mice, along with higher production of key cells involved in the immune system.

Cui and others (2006: 208) refer to environmental enrichment as a combination of ‘complex inanimate objects and social stimulation’. Their research with rats noted that early life stress (repeated maternal separation, being reared in limited nesting, daily handling and so on) could be reversed by enriched environment experiences which trigger the release of nerve growth factors, activating neurotransmitter receptors or enhancing neurogenesis (the production of new neurons). In reviewing the research literature, Lewis (2004: 94) concludes that ‘successful engagement with complex environments, particularly early in development, promises to have pervasive and significant effects on brain development and function’. However, while the laboratory experiments on animals can produce quite specific evidence, scientists are far from linking specific types or amounts of experience to the developing structure or neurochemistry of the brain. Lewis (2004) notes that little work has addressed the question of what key factors contribute to environmental complexity. A summary of the research leads Lewis (2004) to conclude that there are several commonalities, including increased spatial density, social density (in both cases, density is the interaction of two variables of individuals and amount of space) and novelty within the given environment.

The social environment for human development consists of: highly complex family resources and relationships; childcare and school quality and relationships; and neighborhood and community resources and relationships (Shonkoff and Phillips 2000). Although each of these components of social environments may exert a unique impact, they tend to be correlated. For example, children with fewer family resources also tend to experience lower quality schools, more frequent exposure to violence, and poorer neighbourhoods (Hubbs-Tait 2006).

This section has reviewed some of the literature on factors that impinge on the child’s ability to play. It is evident from the literature that endogenous and exogenous factors are inextricably interrelated, and that any cause-and-effect relationship is complex. Children may have certain biological or neuropsychological traits which have an effect on their motivation or ability to engage in, or to regulate, the kind of spontaneous and unpredictable playing that is beneficial to adaptive systems; at the same time, their play expressions may not be supported by the environment, either because the environments do not provide appropriate support or because the behaviour is perceived as inappropriate. These two factors will influence each other by operating in a ‘dynamic coupling’ (Thompson and Varela 2001). Such an understanding points to the need to provide appropriate environments for children to play as a move towards an environmental response to complement, or as an alternative to, a medical model which perceives the ‘problem’ as a deficit within the child.

Play and well-being

The evidence presented to date would suggest that play operates across adaptive systems, enhancing and refining these systems and enabling children to adapt to their unique and complex environments. It represents the development of protective systems, not in a ‘defensive’ mode, but one that seeks to place children in better than neutral positions, that is, to enhance their current level of subjective well-being. Play as a broad and heterogeneous behaviour operates across systems through complex feedback processes at the levels of mind, body and environmental.

Reframing well-being

Throughout our lifetime, the body’s primary purpose is to maintain the optimum state for survival. This requires knowledge about objects, people and situations in the external world as well as knowledge of our own biological systems (Damasio 2003). A biological need for maintaining life (known as ‘homeostasis’⁴) drives organisms to seek a better than neutral

⁴ Although as Rose (2005) highlights perhaps the notion of homeostasis is better represented by the phrase ‘homeodynamics’ which suggests that stability is achieved through dynamic processes and the ability to respond to continuously changing environmental conditions. McEwen (2000; 2007) suggests that the term ‘allostasis’ may be a better term for the process of keeping organisms alive and functioning through maintaining stability through change and promoting adaptation and coping.
state and to enhance their lives; this is what is known as ‘well-being’. So a preferred state is one of joy and pleasure, which makes it easier to do things; the opposite of this, sadness and sorrow, means that organisms find it harder to do the things they need to do and this leads to depression (Damasio 2003).

The concept of well-being, recently gaining favour in public policy outcomes, is multi-dimensional and marks a shift in thinking from a medical model in which health and illness are seen as dimensionally different polarities [Almqvist and others 2006] to one in which individual health and well-being is seen as a product of social relationships, sometimes referred to as ‘social capital’ [Putnam 1995; Morrow 2004; Bassani 2007], a concept that is explored later in this section.

Prilleltensky [2005: 54] notes that well-being may be defined as a ‘positive state of affairs in which the personal, relational, and collective needs and aspirations of individuals and communities are fulfilled’. From this, well-being becomes not simply an absence of disease, but an expression of the mutually influential qualities of the psychosocial, economic, political and physical environment. Also there are many aspects of well-being that reach far beyond health and into the realm of values, thriving, and spirituality.

Traditional approaches to studying well-being adopt an objective standpoint: external agencies measure and judge another person’s life through the application of quantitative measures such as wealth or income, educational achievement, health status and so on (Fattore and others 2007). The limitations of this approach have led to an increasing focus on the ways in which individuals actually construct their own perspectives on well-being.

Keyes’ (2006) review of the research suggests that subjective well-being is a key indicator of mental health and a fundamental component of ‘quality of life’. A subjective perspective acknowledges that individuals evaluate the quality of their own lives. Research now supports the hypothesis that health is not merely the absence of illness, but is also the presence of higher levels of subjective well-being (Keyes 2006; Jutras and Lepage 2006).

Components of subjective well-being

Three broad themes emerge as components associated with an individual’s own perception of well-being:

- **Hedonic or emotional well-being**: This consists of perceptions of avowed interest in life, happiness and satisfaction with life, and the balance of positive to negative affect. Jutras and Lepage (2006) note that this element is also associated with a realistic sense of personal power and a sense of one’s own competence as well as the ability to cope with stress and frustration (also referred to as ‘resilience’).

- **Psychological well-being**: A positive evaluation of oneself and one’s personal history, a sense of continued growth and development as a person, a belief that one’s life is purposeful and meaningful, a sense of competence, and a sense of self-determination. In addition, Jutras and Lepage (2006) refer to the cognitive exercise of mental abilities: problem-solving and decision-making skills, creativity and involvement in personally meaningful activity.

- **Social well-being**: The perception of the quality of relationships with other people, their neighbourhoods and communities. Keyes (2006) asserts that social well-being is multi-dimensional and will include such concepts as social coherence, actualisation, belonging, acceptance, participation and contribution. In addition, Jutras and Lepage (2006) cite that quality of interpersonal relationships is evidenced through a range of supportive relationships, and the ability to empathise and co-operate with others.

The evidence presented to date through this chapter clearly illustrates how play might operate across these themes to promote well-being. Notions of well-being require the systematic examination of human behaviour to map the individual, environmental and transactional character of development across time, space, culture and circumstances (Jutras and Lepage 2006). This highly complex and dynamic web of actions and meanings provides the subjective experiences of daily lives.
Fattore and others (2007) make the point that an understanding of children’s well-being should place children centrally and attempt to appreciate their perspectives and standpoints on well-being:

*Attempting to understand children’s well-being from where they stand, starts from engaging with children as social actors and is driven by their experiences and opinions.* (Fattore and others 2007: 6)

In their study of children’s well-being in Australia, Fattore and others comment that recent approaches have seen a significant shift from a focus on survival and basic needs to ‘beyond survival’ and from focusing on childhood as preparation for adulthood (what Fattore and others refer to as ‘well-becoming’) to the present lives of, or ‘well-being’, of children in their childhoods. Yet it may be that the potential of subjective well-being which takes into account children’s expressed experiences of their own lives is yet to be realised:

... it can also be argued that a failure to take into account children’s perspectives on their well-being in their ‘present[s]’, as they are experiencing their lives as children, marginalises the importance of children’s lives as experienced in the present, not just in the future. If well-being is defined as the successful attainment of developmental milestones, it is less important to take into account the way childhood is experienced by children in the ‘here and now’. Standard measures on educational achievement, for instance, tell us little about children’s own perceptions about the quality of their education or the processes by which they learn. Children are seen as objects of determinants, both internal and external, rather than as engaged social actors with varying levels of control over their social environments. The assumption is that children’s social engagement is irrelevant, or that they lack agency. (Fattore and others 2007: 9)

However, there are several recent ethnographic studies that attempt to seek children’s views about the quality of their daily experiences [see for example Morrow 2004; Rasmussens and Smidt 2003]. Gabhainn and Sixsmith’s (2005) research with children exploring key aspects of their subjective well-being in Ireland highlights the value given to relationships and friendships and the activity-based nature of their relationships, in particular having fun and playing with friends. Of equal significance were children’s expressions of the value attributed to the physical aspects of their neighbourhood, what is referred to as ‘nature and geography’ in the research study. These themes reappear frequently throughout this review.

**The design features of play revisited**

This brief framing of the use of the concept of ‘well-being’ provides a context for beginning to appreciate its connections with play. The evidence presented through this review suggests that the process of playing provides children and young people with the opportunity to adapt to and best fit their complex physical and social environments and to achieve a desirable state of well-being. But as Sutton-Smith (2003) warns, play is no guarantee of this. Indeed, as this review shows, children’s position in society and lack of access to their immediate environments, and the poor quality of such environments, may present considerable barriers to being able to play and thus to actualise the potential that play can offer.

Burghardt suggests that play is largely about the development of connections between motivation, and emotional and reward systems of the brain. The question of motivation, once prominent in discussions about play, may have become less of an area of concern [Burghardt 2005]. Yet it is a key defining aspect of the nature of play, often expressed as ‘personally motivated behaviour’. Looking at animal play in general, Burghardt notes that a feature of play is the continuous and persistent seeking out of opportunities to play. An animal’s relationship to its environment involves the seeking out of stimuli, and the perception of stimuli or cues initiates a further response, what Burghardt (2005: 136) refers to as an ‘appetitive’ stage in which ‘most variation and openness exists’ and where learning and adaptability results. It is within this appetitive stage that most play occurs.
This appreciation of play as a constant seeking out of stimuli that are personally relevant suggests that play is intrinsic, that is, it arises from motivations and urges to engage with the environment, an appetite for seeking out emotionally rewarding experiences. Such motivation will arise when the animal is placed in a ‘relaxed field’, free from stress and not under the influence of other basic motivational systems (Burghardt 2005). As previously discussed, the relaxed field of play may be a space of moderate stress and uncertainty, but this is initiated and valued by the animal, where virtual emotions are exercised to enhance the state of arousal (Sutton-Smith 2003).

It may be that play, or more accurately being playful, is a perceptual disposition towards the environment. Drawing on the work of Gibson (1986), Burghardt (2005) notes that play is facilitated by the presence and perception of specific stimuli in the environment. Kytta, (2004) extending the work of Gibson (1986) and Heft (1997), explains that each individual responds to specific stimuli within the environment in unique and idiosyncratic ways. Any environment offers, or affords, the potential for activity; the actualisation of these affordances is a reflection and interplay of the different characteristics of each individual and the features of the social and physical landscape at any given time.

Haglund and others (2007: 903) suggest that a well functioning system of reward pathways and response to attractive stimuli is a prerequisite for dealing with stress:

The ability to respond appropriately to positive events and situations is vital to the preservation of reward expectation, optimism, and positive self-concept.

This process of motivation, perception and anticipation of reward is underpinned by the transmission of dopamine. Siviy (1998) suggests that dopamine plays a key role in the initiation of play through anticipating pleasure and reward. Through the increased release of dopamine, there is an increase in behaviours such as locomotor activity and systematic searching that...
improves the chance of actualising the affordances offered within the environment. This process is self-rewarding and reinforcing; ‘play, in its various guises, makes life worth living’ (Burghardt 2005: 393).

It is from this perspective that the significant value of play in supporting children's well-being becomes apparent. Such a perspective offers an alternative to the ‘instrumental’ viewpoint of play discussed in Chapter 1. Yet perhaps this reframing of play offers a far greater potential for responding to some of the current concerns about children and childhood.

Moving away from using play in a utilitarian and causal fashion as a tool to solve social problems towards a more holistic stance, which accepts play as a multifaceted behaviour in which children seek situations of arousal and uncertainty enables a shift from locating children as being at risk and having deficiencies and therefore in need of targeted interventions to one in which there is an acknowledgement that children are equipped with a range of adaptive systems, or ‘ordinary magic’ that will enable them to survive and thrive in the many localised environments they encounter in their daily lives. Attention then becomes focused on the nature of these environments to ensure that they can support the enhancement of adaptive systems. As Moss and Petrie (2002: 111) acknowledge in their outline of ‘children’s spaces’:

We are trying to suggest the importance we attach to: providing opportunities for excitement, wonder and the unexpected; children living childhoods not entirely ordered and determined for them by adults and their preoccupations; relationships and experiences that are not defined or legitimated only in terms of work and outcomes; the value of play and playfulness in its own right, and not just as a means to other ends.

The next section explores some of the implications of this for responding to current concerns about contemporary childhood and children’s well-being.

Play and health

The state of children’s health in the UK is a matter of considerable current concern. Trends towards an increase in numbers of obese children and declining levels of children's health and well-being (as previously described) have been observed in many western countries (Almqvist and others 2006; Alton 2007). Data from Chinn and Rona’s (2001) longitudinal study of primary school children from three independent studies in the UK from 1974–1994 notes that overweight and obesity on the basis of body mass index (BMI) have increased noticeably since 1984. This trend has continued and given rise to growing concerns about the life expectancy of the current generation of children. Boseley (2005) reports that there are over one million obese children under 16 living in the UK, a third of the total in Europe. Some researchers predict that children of the current generation may die at an earlier age than their parents because of the health effects of inactivity, poor diet and obesity (Olshansky and others 2005). Most studies acknowledge that rising trends in children's obesity will almost certainly be represented in later trends in adult overweight and obesity and probably in an increase in associated adult morbidity (Chinn and Rona 2001). Alton and others (2007) estimate that 50 per cent of obese children become obese adults.

It is increasingly recognised that the phenomenon of childhood obesity is highly complex, with different interrelated genetic, metabolic, psychological, behavioural and environmental components, making causal pathways difficult to identify (Ells and others 2005). Given the tracking of obesity and the associated risk factors, it is apparent that the period of childhood is important for establishing preventative measures.

Diamond (2007) suggests that a full understanding of human development is influenced more and more by an appreciation of the multi-layered interrelations between cognitive abilities, emotions and motivations, perception, physiology, social relations and culture. From this perspective we may see that physical health and mental health are intimately interrelated. What we think and feel affects how our bodies function and how our brains develop. We
are social beings and our physical and mental health can suffer if we do not have caring relationships and meaningful and reciprocal connections to others.

Equally, the health of our bodies affects how our brains work:

Our thinking suffers, our brains atrophy and our vulnerability to disease increases if we are stressed, providing a powerful mechanism by which one's social situation, interpersonal interactions and emotions can affect one's cognitive performance, brain tissue and physical health. (Diamond 2007: 153)

Many of the policies aimed at improving the health of children and young people will have an impact on their mental as well as physical health; indeed, the BMA (2006) report highlights the fact that good physical health is dependent on emotional well-being. Good health is not merely the absence of illness. As Kaplan and Kaplan (2005) suggest, it seems inappropriate to consider people as healthy when they are irritable, feel frustrated in their ability to make plans and act in a competent manner and so on. They consider good health to be about feeling positive and effective, being clear-headed and resilient and that ‘furthermore, health extends beyond personal well-being to community well-being’ (Kaplan and Kaplan 2005: 272).

The interrelationship between physical and mental health may be illustrated by Bedimo-Rung and others (2005), who cite research indicating that exercise reduces depression symptoms; combining this with exercise in green spaces and parks brings an associated restoration effect from being in nature. Research by Pretty and others (2007) clearly indicates that both access to nature and physical activity improve mental health and psychological well-being over a short period. The authors also suggest that if the activity in green space is valued and enjoyable, it is likely to lead to further exposure to such experiences and continued health benefits.

Batch (2005) comments that physical exercise for children has many positive benefits and provides the opportunity for play activity and pleasure, allowing the child to explore their environment. Physical activity also facilitates the development of motor skills and increases energy expenditure. There is evidence that regular physical activity contributes to the primary and secondary prevention of several chronic diseases and is associated with a reduced risk of premature death (Alton 2007; Warburton and others 2006). Suandicani (2004) notes that regular physical activity has an impact on plasma lipids, circulatory functions, blood pressure and body mass index, leading to a better cardiovascular risk profile and lower risk of type II diabetes and ischaemic heart disease. Research by Saakslahti and others (2004) with children aged 4-7 years old in Finland suggest that levels of physical activity, particularly the amount of playing outdoors and the amount of ‘high intensity’ playing, correlates with coronary heart disease (CHD) risk factors and presents a protective factor in childhood.

Garcia and Baltodano (2005) summarise research findings which suggest physical activity relieves depression and anxiety by providing opportunities for social interaction, increased feelings of self-mastery and self-efficacy and stress relief. Equally, a research review undertaken by Ekeland and others (2005) clearly suggests that physical activity may be effective in improving self-esteem in children and young people, at least in the short term and for children and young people at risk. Given that all the research considered by Ekeland and others indicates many positive outcomes from physical activity and no negative impacts, they conclude that it is an important instrument in improving children's health. However, they do note that the specific forms of activity that best contribute to this are not apparent through the research review.

Engaging in physical activities that provide optimal amounts of enjoyment, challenge and self-direction, as opposed to stress, boredom and external direction, are important outcomes to measure when evaluating the positive benefits of different physical activity engagement experiences (Poulson and Ziviani 2004). Where children are in a ‘relaxed field’ (meaning that their basic survival needs have been met) and have surplus energy resources available, they can respond to attractive and novel stimuli within the environment, and there is more opportunity for motivated reward seeking behaviours, namely play (Burghardt 2005).
Hume and others' (2005) research into children's activity patterns in Australia shows that children's perceptions of specific aspects of their home and neighbourhood correlate with their participation in different intensities of physical activity. The authors note the significance of the home for children, who described this as a site of safety. Studying children's reported value of this space, most of the children participated in sedentary activity, and few reported opportunities for physical activity. However, the report also notes that children who reported high levels of sedentary activity in the home also tended to report high levels of physical activity outside the home, leading to a questioning of perspectives that seek to place sedentary and physical activity as either/or factors in children's activity patterns; rather they co-exist as significant and valued aspects of children's daily lives. In their outdoor activities, the research indicates children's value of the school playground for play, and the social connections made at school also influence children's social interaction in the neighbourhood. Similarly, open areas and green space also appear in children's accounts and photographs as important features in the local environment for both physical and social activity. Hume and others (2005) highlight the importance of undertaking both qualitative and quantitative research to gain a fuller picture of children's activity patterns and the places and activities they value both at home and in their immediate neighbourhoods.

Mackett and Paskins' (2004) research emphasises that walking and playing away from the home can contribute significantly to children's health through physical activity. Their analysis of multiple factors associated with children's activity patterns clearly suggests that the place where children tend to be least active is in their own home. When they do go out, unstructured events (playing) tend to be more active than structured ones. The report indicates ways in which walking and playing will enhance health:

- they both have high intensities of physical activity compared with most events
- they tend to be mutually reinforcing: children tend to walk to unstructured activities, and children who walk to events tend to be more active when they arrive than those who go by car, and this includes playing.

The authors note that given the level of parental concern about decreasing physical activity levels of children and their health implications, their findings provide powerful arguments for the significance of the need for children to walk and play out. Brunton and others (2005), in their review of research into intervention programmes to support children's physical activity, comment that, to a large extent, children and parental views about activity are not given priority in developing health intervention schemes. The research review concludes that aiming to provide safer local environments in which children can actively travel and play with their friends may be an effective approach to supporting children's physical activity.

Almqvist and others (2006) comment on the importance of understanding and linking children's perception of health with designing activities and environments that support positive health behaviour. They note from their research with 4- to 5-year-old children that young children perceive health as a multi-dimensional construct formed around three key features of everyday functioning: healthy lifestyle, mental health (including a general sense of well-being) and the nature of social relationships. The analysis indicates that ‘engagement’ is an important factor in children's perception of health. In this sense, engagement seems to capture key elements of activity and participation:

**Children that interact with the environment and are encouraged to develop a higher level of engagement also develop a wider behavioural competence. Thus, young children understand that their role as active participants in their everyday context is important in relation to health.** (Almqvist and others 2006: 282)

Children's responses in Almqvist and others' study indicate a series of variables connected with health, including: the possibility of performing different activities, the joy of sharing in activities with others, and a supportive environment. But as the authors suggest, the most salient responses relate to the possibility of playing. This implies that improvements of child
engagement and ensuring opportunity to play should be emphasised in health promotion and to a greater extent be the central focus of health interventions for young children.

Mota and others' (2005) observations of activity in 8- to 10-year-old children during school recess time in Portugal, notes the significant contribution made by active free play to children's recommended period of daily moderate-to-vigorous activity. Burdette and Whitaker (2005) suggest that the focus on increasing children's physical exercise perhaps represents a narrow attempt to improve children's health and well-being. The research highlights, particularly in the early years, the need to change the language associated with preventative health care and move the focus from 'physical exercise' to 'play'.

Compared with adult activity, children at play have more spontaneity and less interest in sustaining a specific single activity. The level and patterns of physical activity of children change as they get older, with the physical activity patterns of children tending to be of short duration with high intensity. Play offers the opportunity for environmental interaction in response to the many stimuli that the environment (human and physical) offers. The range of choices, effort and persistence shown through playing are adaptive outcomes of activity engagement that are associated with increased intrinsic motivation and positive physical activity experiences (Poulsen and Ziviani 2004).

The current focus for responding to the obesity 'epidemic' relies on discussions of amounts of exercise and dietary habits. Burdette and Whitaker (2005) suggest that more emphasis should be placed on the three 'a's of physical health: attention, affiliation and affect.

- **Attention** Exploring issues of enriched environments and the improvement in cognitive skills (Wells 2000), Burdette and Whitaker highlight the significance of the 'enriched' (or natural) outdoors to support free play and opportunities for decision-making and problem solving. Alongside this, the outdoors generally provides a space in which there are fewer restrictions on physical movement and exploration (Lester and Maudsley 2006). Fjortoft's (2004) study with children aged between five and seven years in kindergarten in Telemark, Norway, shows that children who played in a natural environment made significant gains in physical motor fitness in comparison with a control group who played in their usual playgrounds featuring the same equipment (slides, sandpit, swings and so on) but without the natural elements presented to the experimental group. Fjortoft comments that natural environments afford more diverse play opportunities for children than traditional playgrounds; rough and uneven surfaces provide movement challenges, and landscape features and vegetation provide a diversity of different designs for playing and moving. The results of the study show that the experimental group displayed greater balance and co-ordination skills than the control group who played in a traditional playground. Fjortoft notes that these key abilities are components of all basic movements and are improved with diverse movement patterns. Spinka and others (2001) also suggest that animals tend to play more in new, rare, or more demanding local habitats. Equally, environmental change may stimulate play. Similarly Yun and others (2005) highlight the importance of engagement with diverse and challenging environmental cues to increase variable heart rates and retain flexibility in movement.

- **Affiliation** Play provides the opportunity for social interaction and the development of affiliations. The complex nature of social relationships developed through play may support and enhance the development of a range of social and emotional capabilities such as empathy, self- and other-awareness and self-regulation. Peer play culture thrives when children find time away from adult supervision.

- **Affect** Play is an enjoyable experience which promotes positive affect and reduces anxiety, depression and sleep problems. Williamson and others' (2001) study with 9- to 10-year-old children in the UK suggests that there is a significant increase in positive mood and significant decrease in negative mood following exercise. The results of the study by Penedo and Dahn (2005) add to a growing literature which suggests that exercise and physical activity have beneficial effects across several physical and mental health outcomes. Burdette
and Whitaker suggest that gross motor play may be an important mechanism to reduce the physiological wear and tear on the body that results from the effort of responding to stress.

Recognising the significant contribution that play can make to children's health and well-being, Burdette and Whitaker suggest that attention should be given to ensuring that there are sufficient community resources to support children's play, through the provision of neighbourhood play spaces, traffic calming measures and creating stimulating streets and yards within local residential areas. The research concludes:

> We should promote it [free play] on its traditional merits – that play allows children to experience the joys of movement, creativity and friendship. Though it seems urgent to emphasise that play improves energy balance, we may get further in obesity prevention by realising that modern neurobiology supports grandmother’s conventional wisdom that the brain will naturally reinforce behaviours that make it healthy. (Burdette and Whitaker 2005: 49)

Vaillant (2003) reviews the various attempts to define positive mental health and suggests a number of distinct approaches which include positive psychology, maturity (recognising that the human brain continues to grow throughout a lifetime), emotional intelligence, subjective well-being and resilience. In conclusion, Vaillant suggests that these are highly correlated with each other and provide multiple and interconnected ways to begin to appreciate the complexity of the qualities of positive mental health and well-being.

**Play and social capital**

Social capital is a somewhat elusive and multifaceted concept (Leonard 2005) that has become increasing influential in framing social policy (Barnes and Prior 2007). A fundamental feature of social capital is the importance of social networks and trust in promoting a sense of belonging and well-being. Putnam (1995: 67) defines social capital as ‘features of social organisation such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit’. Social capital is a resource that enables individuals or collectivities to act in certain ways and to do certain things they could not otherwise do. Putnam distinguishes between two forms of social capital:

**Bonding:** Bonding relationships refer to the social ties between people with similar identities and shared interests, enabling individuals to act together to achieve common goals. These relationships provide benefits of mutual support, care and protection, although such networks may also be exclusive, not extending their care and support to outsiders.

**Bridging:** Bridging relationships refer to the social ties between people with different identities and interests but some shared experiences, enabling dialogue between groups and agreement on joint action in pursuit of common goals. Here, norms of inclusivity, reciprocity and mutual understanding are significant, although for individuals such networks may not be able to offer strong sources of personal support (Barnes and Prior 2007).

Halpern’s (2005) analysis of research data highlights a strong relationship between social capital and mental and physical health. However, simply knowing someone is not sufficient; the quality of the relationship is of prime importance. The most powerful and beneficial health aspects arise from positive and supportive relationships, what Halpern refers to as micro-level bonding capital.

Much of the empirical work underpinning the concept of social capital is based on studies of adult ties and connections, with scant attention to children and their networks and relationships (Leonard 2005; Morrow 2004). One of the key criticisms of Putnam’s (1995) social capital model is that it is based on middle class norms and values. For example Boggs (2001: 284) suggests that the apparently arbitrary selection of indicators used by Putnam to measure decline in social capital is based on ‘mostly safe, conformist, traditional community activities favoured by the older generations, and within these generations, by largely middle-class, or upper middle class strata’.
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What Putnam’s analysis fails to address is the contextual factors that play a role in determining what is of situated social value. As previously discussed, the research by Sutton and others (2007) would suggest that children's valued social capital of playing out in their local environments may not sit comfortably with middle class variables of social capital. When children are brought into the picture, it is often in a limited way, which places them as passive recipients of adult social capital. In this way, children’s own social networks are largely rendered invisible (Holland and others 2007). Equally, Leonard (2005) suggests that social capital is viewed as a future orientated asset for children, something they will benefit from at a later stage in their development, again a reflection of the discourse of children as human becomings rather than human beings.

The realisation of social resources into social capital is ‘not simple to delineate because humans are multidimensional and their behaviours are embedded within their unique cultural and historical contexts’ (Bassani 2007: 24). Children's play could represent a biological, social and environmental resource which operates across basic adaptive systems, but the mobilisation of this into social capital and the well-being that arises from this process will be subject to highly complex and multifaceted factors.

A number of studies have recently sought to extend the potential of social capital theory by studying the nature of children’s and young people’s social networks.

Holland and others (2007) provide a review of three research projects that explore different transition contexts and the development of social capital: transitions from primary to secondary school, from youth to adulthood and the construction of identity for Caribbean youths in the UK. Applying Putnam’s concept of bonding and bridging capital, their review notes the diverse ways in which children and young people draw on their peer social networks as positive resources to cope with the transition. For example, children who move to secondary school with an existing supportive peer group draw on the bonding capital that this offers to become familiar with the school and negotiate the novel rules (both formal and informal) and practices. This bonding capital also provides a secure base for a bridge into new relationships. Holland and others (2007: 113) comment:

> These young people are active agents in the production of social capital; they use social capital as a social resource to negotiate transitions in their lives and in the construction of identity. Social capital is differentiated according to its ability to establish bridging and bonding networks.

Goodwin and Armstrong-Esther’s (2004) research into young people's health and well-being in rural Wales acknowledges the prime role of social contexts as key determinants of social capital with, in the case of children and young people, a complex and diverse range of networks
that they encounter in their daily activities: family structure, schools and other institutions, peer groups and local communities. While having a primary health related focus, Goodwin and Armstrong-Esther's research [2004: 61] highlights the ability of children and young people to engage in peer support and participate in their own activities, and concludes that the 'children themselves are a key resource when examining and promoting health-enhancing behaviour'.

Offer and Schneider's [2007] US study of children's and young people's development of social capital explores the bi-directional nature of parents' and children's contribution to the production of social capital. Their research suggests that adolescents make a significant contribution to the development of family social capital. The strong networks that young people develop in their local communities offers the potential for parents to meet other parents. However, they note that low-income families living in poor quality neighbourhoods may be denied the opportunity to accrue this form of social capital by restricting their children's independent movements in the local community:

In trying to protect their children, parents may distance themselves from other parents who may share similar values and norms. By distancing from these parents, they are also less likely to become involved in exchanges that could lead to social support. Considering the role social capital plays in educational and occupational success, the mechanism described in this study could yet be another source of inequality that should be tested in future research with more diverse populations. (Offer and Schneider 2007: 1138)

Morrow (2004) provides an example of how the concept of social capital may be applied in the study of children's subjective expressions of well-being. Morrow's research, carried out in two schools close to London with 12- to 15-year-olds, focused on some key issues in relation to children's valued experiences. Using a variety of qualitative research methods, Morrow's findings can be summarised under the following key themes:

• **The nature of children's social networks** The research reinforces the notion that children spend more time with their peers than with their families. Daily activities were often structured with friends, and children's expression of their feelings about where they lived often centred on the proximity of friends. Relationships with family were considered to be very important, playing an important role in a sense of well-being by being a source of emotional support. The research highlights the centrality of family and friends to establishing a sense of belonging rather than the presence of specific physical place features.

• **Attitudes to community resources and institutions** There were considerable differences in children's responses to questions about the neighbourhood and amenities based on gender, ethnicity and age. There was no clear consensus about neighbourhood safety within the research group: children from both schools expressed not feeling safe in local parks and on the street. There were some negative comments about neighbours as 'moany', although some of the group did express positive relationships, especially where they were long-standing neighbours. Traffic was seen as a problem for the younger children in the study. Both year groups mentioned not having enough to do in their neighbourhoods, with several younger children commenting on the lack of wild places to make dens. Also, children in one of the schools were not allowed to play football near their homes on communal green space.

• **Community and civic engagement** Participation in local communities was extremely limited and children did not seem to feel that they shared in community life, although the council had recently started a youth forum.

The study highlights how:

... a range of practical, environmental and economic constraints were experienced by this age group. These included not having safe spaces to play, not being able to cross the road because of the traffic, having no place to go except the shopping centre, but being regarded with suspicion because of lack of money. The extent to
which children moved around freely to participate in activities with their friends is likely to be constrained by the physical geography of the built environment, issues of community safety and traffic, parental norms about where children may go out, as well as access to financial resources. These issues are usually neglected in studies of children’s health behaviours. (Morrow 2004: 222–223)

In conclusion, Morrow comments on the paradox that a focus on the here and now of children’s lives rather than a future adult perspective would suggest that children are generally excluded from the social life of the community. Yet children also ‘exist in the future and activities they undertake now for whatever reason have implications for their future wellbeing’ (Morrow 2004: 223).

Play and learning: a critical perspective

Lofdahl (2005) notes that the ambiguity associated with play has led to different views of children’s learning and the role of play. While there is an assumption that play has a functional relationship to learning, a deeper and broader appreciation of the nature of play is not fully explored and, as such, teachers are left in an ambiguous position themselves, uncertain about their own role in play as well as the nature and value of play within the curriculum.

Farne (2005) suggests that the interest of the educational field in the relationship between play and learning lies within a narrow instrumental approach through the design and management of playing experiences to meet clearly defined educational goals. Pramling Samuelsson and Johansson (2006: 49) cite De Jonghe (2001: 7) who, in her international review of the current state of research on children’s play, notes:

When educators speak about play, it is mostly in this instrumental sense of play: play as a means to reach a further goal or learning result, not the inherent value of play, is central in this vision.

This narrow discourse of learning through play is, according to de Jonghe, expressed in terms of learning-centred play, playful learning, pedagogical play, play-based learning, and so on.

This point is acknowledged by Lofdahl (2005) who highlights the attractiveness of the ‘progressive’ elements of play (the development of desirable cognitive and social capabilities), while at the same time, the less desirable elements, referred to in her work as ‘chaotic play’, cause great anxiety for teachers. Through her research with teachers, Lofdahl (2005: 197) asserts that these forms of play (for example play fighting, perceived violent play forms and ‘dizzy’ play) are not valued because they ‘destroy our ideal picture of play’. Yet it is these forms of play that prove to be highly attractive to children. Citing the work of Bergstrom (1997), the study notes that play is seen as children’s possibilities, and both structure and chaos feature in shifting patterns within the play, ‘thanks to play, brain systems can develop when chaos is allowed to flow, therefore children should have the opportunity to play and to let all sides of play flow’ (Lofdahl 2005: 197).

Following structured interviews with preschool and nursery teachers, Lofdahl discerns a number of themes in teacher’s responses to children’s chaotic play. A common feature in responses was a perception of the ‘danger’ involved in chaotic play, the play was noisy and messy, children could have hurt themselves and it was not ‘real play’, as such it needed to be brought under control and substituted by more productive forms of play. A second theme that also emerged across responses was the need to ‘supply meaning’ to chaotic play when it emerged. Thus, teachers intervened to ‘guide’ the play as a way of controlling and re-establishing some adult order and direction to the play. Another approach to supplying meaning was also expressed through the provision of props and space for chaotic play to take place.

Lofdahl notes that few of the teachers expressed any sense of perceiving meaning from the children’s chaotic play forms and feels that this is a significant dilemma. The traditional view of play and learning leaves little room for an appreciation and valuing of the nature of chaotic play. While the ‘danger’ and ‘giving meaning’ perspective are supported by an educational culture that justifies intervention to restore control and order, the acceptance of these play forms as
significant in their own right places teachers in an ambiguous position. Lofdahl highlights the importance of teachers adopting a more reflective stance in working with these play forms, to follow the leads of children and to have a theoretical and practical knowledge base to support them in their interpretations of children’s chaotic play behaviours.

Targeton (2005), commenting on the educational reforms in Norway, suggests that much of the research literature and training material for teachers is clearly targeted to early years provision and little is known about the nature of play and learning in the primary school context. For the reforms and the development of a play-based curriculum to be successful, all teachers must have a thorough training in play pedagogy [Targeton 2005].

The child's perspective

Howard and others (2006), through their research with 4- to 6-year-olds in Australia, highlight the importance of appreciating what children actually value in their play experiences in the classroom as a prerequisite for developing appropriate play and learning experiences for children. They note that much of the research literature considers play and learning from an adult perspective, and understanding children’s play from the child’s perspective should be the first step in designing a play-based curriculum. The research suggests that children can readily distinguish between play, non-play and work within the classroom, drawing on behavioural, social and environmental cues to inform their judgment of play and non-play situations. On this basis, Howard and others highlight research which suggests that children identify key cues that indicate they are playing, including: enjoyment of the task, the opportunity for pretence, the absence of predetermined goals and the amount of control held by the children in their play. Along with this, children are also sensitive to environmental and social cues, such as where the activity takes place and who is available to support the play.

The research concludes that appreciating the cues used by children to categorise their classroom activities assists understanding of the developmental potential of play; teachers may manipulate the environment to promote playful experiences.

Fitzsimmons and McKenzie (2003) highlight the role of humour in supporting the learning process. Their study indicates that ‘humour as play’ can:

- have a positive effect on the classroom atmosphere and culture, and the nature of interpersonal relationships
- provide an environment for developing and communicating ideas and feelings in a safe frame
- build a climate of empathic support in the classroom
- provide opportunities for children to understand the world, interact with each other, and express and develop their symbolic capabilities.

Fitzsimmons and McKenzie (2003) suggest that play should be an essential component of the curriculum. Similarly, Masselos (2003: 224) explores the development of humour in young children and indicates that early years educators should provide opportunities for children to have the freedom to ‘appreciate, experience, enjoy, and engage in, as well as take risks in humorous situations and playful behaviours’. The conclusion to Masselos’ observations of four-year-old children's play indoors and outside in a preschool highlights that with shared humorous experiences, children begin to fine tune their responses, develop creative expressions of their uses of humour, enjoy these occasions and use humour to relieve tensions that emerge in play.

Concluding remarks

This chapter has reviewed the literature on the importance of play in the lives of children, bringing in a number of alternative perspectives to the dominant paradigm of childhood as a period of preparation for adulthood and play as a way of rehearsing the skills needed in adult life. The findings show that play is an emotional endeavour; and that this is what shapes the architecture of the brain. These emotions provide both motivation and reward in a continuous cycle of emotional and bodily engagement with the social and physical environment.
Reid and Belsky (2002: 584) comment that, as research into children and their environments continues, in all likelihood ‘what will be discovered is that typical experiences provided on an everyday basis to most children in most families will be more than sufficient to foster normal brain development’. This section of the review has shown how play makes a significant contribution to these ‘typical experiences’. However, taking things out of the environment is likely to have a deleterious impact on development (Smith 2002). The lesson for policy-makers here is that paying attention to children’s environments and making them more ‘playable’ could produce significant rewards in terms of children’s health and well-being.

What can be seen from this review of the literature on the importance of play in the lives of children is that it can make a significant contribution in broad, principled terms to the five outcomes of the Every Child Matters (ECM) agenda: be healthy, stay safe, achieve and enjoy, make a positive contribution and achieve economic well-being. However, an understanding of how play contributes to these outcomes needs to be grounded in the key messages from the research reviewed in this chapter. That is, that the characteristics of playing (for example, control, uncertainty, flexibility, novelty, routine, adaptiveness, non-productivity) are what give rise to pleasure and therefore further motivation to play, and in so doing help to shape and develop links between the regions of the brain involved in emotion, motivation and reward systems, supporting the vertical integration of brain regions, and refining coordination between perceptual, motor and thinking systems. Such an understanding of play allows those responsible for creating places for play to move beyond a focus on the content of playing as an indication of skills to be rehearsed for future adult life, towards an understanding of a more fundamental and emotional purpose for play. The chart on page 127 attempts to show how the research reviewed in this section can ultimately contribute to the five Every Child Matters outcomes.
Play, the five outcomes and the big picture

Everything is interconnected
The evidence presented in Play for a Change shows the interconnectedness of environment, health, well-being and development. The emerging brain sciences make it clear just how far genes, brain, body and environment interact continually in a lifelong developmental process. The brain is complex, a vast network of actual and possible synaptic connections. The continual interaction of genes and environment determines the growth of new synapses and which synaptic connections become actualised, thereby determining the architecture of the brain.

Playing and adaptability
Playing, with its unique characteristics of unpredictability, novelty, flexibility, personal control, imagination and ‘as if’ potential, has an impact on gene expression, brain connectivity and brain chemistry, which in turn influence the child’s ability to adapt to, survive and thrive in her or his social and physical environments and to shape that environment. Although play can help to develop specific skills, its primary benefits are to do with emotions and motivation (Burghardt 2005), which underpin specific skills development and flexible behavioural responses as well as health and well-being.

Playing and resilience
In particular, play can help build resilience, the capacity for children to thrive despite adversity and stress in their lives. Key elements of resilience are the ability to regulate emotions, strong attachments and peer friendships, enjoyment and general positive and optimistic feelings, being able to cope with stress, being physically and mentally healthy. Play makes a fundamental contribution to all of these elements.

Resilience and social policy
The final report on the policy review on children and young people (HM Treasury and DfES 2007a), a part of the Comprehensive Spending Review, announces a new emphasis on building resilience, with a focus on three protective factors: high educational attainment, good social and emotional skills and positive parenting. The section on social and emotional skills highlights self-awareness, the ability to manage feelings, motivation and empathy. The evidence presented in Play for a Change shows how play is a highly effective mechanism for achieving this.

The spider’s web diagram overleaf shows the interrelationship between play, resilience, social and emotional skills and the five outcomes, linking these to the resilience factors adapted from Masten and Obradovic (2006). Attempts at fitting the wide-ranging evidence generated from this review into discrete outcome boxes runs the risk of reducing this highly complex form of behaviour to simplistic linear and causal relationships, exactly the thing that current studies into the nature of resilience warn against (Rutter 2006). The key benefits of playing given on the following pages serve as an illustration of the complexity and interconnectivity of the relationship between play, well-being and the ECM outcomes.
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Play in this context is flexible, unpredictable, imaginative, peer/self-directed, ‘as-if’ behaviour.

1. Mental and physical health are interlinked (Diamond 2007).
2. Play provides a way of experiencing the primary emotions (anger, fear, sadness, happiness, disgust and shock) that are necessary for survival, at the same time keeping them in check through the rules and rituals of playing (Sutton-Smith 2003), thus helping to develop emotion regulation.
3. The unpredictability of play helps develop neural capacity to ‘roll with the punches’ of everyday social interactions (Siviy 1998).
4. Those who have not had exposure to novelty or the unexpected through play may pay more attention to potential threats and become more stressed by these threats (Fox and others 2007).
5. The enjoyment, challenge and self-direction of playing, as well as the range of motor actions, are more effective than externally directed exercise regimes that may be boring or stressful (Poulsen and Ziviani 2004).

6. Regular physical playing helps prevent chronic diseases (Alton and others 2007) and relieves depression and anxiety (Garcia and Baltodano 2005).

7. Enriched natural environments, strong social networks and enjoyment create the best opportunity for play and physical health (Burdette and Whitaker 2005).

8. Children seek novelty, disequilibrium and risk in their play (Spinka and others 2001; Kalliala 2006).

9. Play is ‘training for the unexpected’, both physical and emotional (Spinka and others 2001).

10. Play allows for the expression and experience of strong emotions within the safe frame (Sutton-Smith 2003).

11. Rough and tumble play is ‘a sane and safe way of putting our vulnerabilities on the line’ (Sheets-Johnstone 2003).

12. Risk-taking in play offers a way of being ‘in control of being out of control and so enjoy a sense of both risk and mastery simultaneously’ (Gordon and Esbjorn-Hargens 2007).

13. Mild stress is beneficial in terms of creating a variable heart rate (Yun and others 2005) and developing resilience (Rutter 2006).


15. Play allows us to ‘roll with the punches’ associated with daily social interactions (Siviy 1998).

16. Children are capable of assessing risk (Levin and Hart 2003).

17. There is evidence that parents have become increasingly restrictive when it comes to unsupervised play and independent mobility. There is growing concern that there might be long-term costs to a generation of children that have had less opportunity to experience the world, make mistakes and learn from these experiences (CAPT 2002).

18. The enjoyment of playing leads to ‘positive affect’ (feeling good) and this has benefits for flexible thinking and problem solving, mastery and optimism and enhances performance (Isen and Reeve 2006; Pressman and Cohen 2005).

19. Positive emotions can be a buffer against maladaptive health outcomes (Tugade and others 2004).

20. Humour and laughter help develop social competence (Loizou 2005).

21. The enjoyment of playing promotes flexible thinking and facilitates the acquisition of personal resources that can be drawn on in times of need (Frederickson 2006).

22. Positive emotions generate psychological resources by promoting resilience, endurance and optimism (Salovey and others 2000).

23. Young children who are successful at playing with peers also show greater cognitive, social and physical abilities than those who are less skilled at playing (Fantuzzo and others 2004).

24. There is a positive relationship between cognitive skills and high quality play (Gmitrova and Gmitrov 2004).

25. Play helps to develop effective mechanisms for learning rather than specific learning (Burghardt 2005).
26. Pretend play engages many areas of the brain because it involves emotion, cognition, language and sensorimotor actions (Bergen 2002).

27. Play, particularly pretend play, is linked to creativity in the sense that it involves divergent thinking, symbol substitution, positive affect, problem solving skills and emotion regulation (Russ 2004).

28. Positive attachments are a key element in developing resilience, and begin with the primary carer but also develop through wider social networks as children grow (Hofer 2006).

29. Positive peer friendships may compensate for poor early attachment (Booth-Laforce and others 2005).


31. Pretend play, role play and rough and tumble play enable children to develop sophisticated attachments with peers (Andreson 2005; Freeman and Brown 2004; Reed 2005).

32. Through peer play children make positive contributions to their own social networks and to the development of play cultures (Corsaro 2003).

33. Play culture can be cruel (Hughes 2006) and can also evoke adult disapproval (Kalliala 2006; Ross 2004).

34. Children’s outdoor play helps to build attachments to place; playing in the natural environment helps develop environmental awareness (Lester and Maudsley 2006).

35. Children and young people can make a positive contribution to the design, building and maintenance of public spaces (CabeSpace 2004; Brothwell 2006).

36. Children’s play within their local communities enables children and young people to develop relationships with adults who are beyond the family and live in their neighbourhood. These forms of neighbourhood relations establish a strong sense of community and less fear of crime and, in turn, these later variables consequently reduce feelings of loneliness during adolescence (Prezza and Pacilli 2007).

37. As children have little economic independence, this outcome relates either to the current drive to eradicate child poverty, or to children’s potential place in the employment market as adults.

38. Children’s peer friendships can act as health and psychosocial protection factors for children living in poverty (Attree 2004).

39. The growth in out of school childcare is a key element of the government’s drive to eradicate child poverty; however, children’s ability to engage in free play varies across provision (Barker and others 2003).

40. Creativity is seen as an important element of education for future economic prosperity (NACCCE 1999); play is an important contributor to creativity (Russ 2004).